

## PROJECT INFORMATION

<b>Project Title</b>	Greenhorn Creek Integrated Restoration Project
<b>Brief Description</b>	<p>This project addresses channel erosion, fish passage barriers, and loss of agricultural productivity along Greenhorn Creek in American Valley near the town of Quincy. Land use along the channel is primarily agricultural. The project seeks to improve water quality and trout productivity by stabilizing actively eroding areas of stream bank and streambed, and restoring fish passage at two agricultural diversion dams. These actions will also stem the on-going loss of agricultural land to bank erosion, and protect the two diversion dams from failure. The Greenhorn Creek Integrated Restoration Project is comprised of six treatment areas along Greenhorn Creek in American Valley, totaling 21 acres and 3,633 feet of stream channel. One of the six treatment areas was constructed in October 2011. This application seeks funding for construction at four of the other five treatment areas. The SNC funding would treat 13.6 acres of aquatic and riparian habitat and 2,720 feet of channel. The fifth treatment area would address bed stabilization at a bridge, and would be constructed using landowner funds, however, it is not certain that the landowners will fund the work. Because the bridge is only marginally associated with agriculture, and implementation is uncertain, this treatment is not requested for funding, is not included as match, and will not be discussed further. Of the four treatment areas in need of SNC funding, two address bank stabilization, and two address fish passage and irrigation dam stabilization. The two bank stabilization treatment areas (Farnworth &amp; Hansen/Shea/Labbe) would involve laying back 6-8 feet high eroding banks to a 2:1 slope, vegetating the banks and installing boulder vanes. (Boulder vanes are a line of boulders set at floodplain elevation and angled upstream. The vanes maintain flow vectors in the center of the channel, induce deposition along the bank, and maintain pool depth through scouring action.) The 2.8 acre Farnworth treatment area would treat 220 feet of bank and install 30 cubic yards of boulders in two vanes. The Hansen/Shea/Labbe treatment area would stabilize 900 to 1,800 feet of channel and install 220 to 435 cubic yards of boulders in 10 to 20 vanes. Uncertainty with treatment at this location is due to the recent occupation of one of the eroding banks by bank swallows, a California threatened species. Pre-construction surveys and close coordination with the California Department of Fish and Game will determine the final degree of treatment in this area. Bank swallows require freshly eroding streambanks for nesting. Thus, bank stabilization has contributed to their decline. Treatment goals on the Hansen/Shea/Labbe reach include the protection of bank swallows as well as meeting landowner goals of reducing erosion as much as possible. The two fish passage treatments are located at agricultural irrigation dams, both of which are in danger of collapse. Bed erosion below both of these dams has created impassable fish barriers, and is undermining the bed on which the dams are built. Loss of these dams would be catastrophic for</p>

	<p>both Greenhorn Creek and the irrigators. The irrigators would lose substantial productivity from their irrigated pastures, and the channel would be subject to severe head-cutting, which would also lead to drying of the meadow (and subsequent loss of irrigation efficiency). Just above the dams, the channel bed is still at an elevation where flood flows can access the floodplain. On-going bed erosion has created an abrupt drop of eight feet at these dams to date. Treatment would consist of rock channel and floodplain structures that would stabilize the bed, allow upstream fish migration, and protect the dams. The structures would be constructed at a 5% grade. The structures are designed to require no maintenance, allow fish passage, and dissipate the energy of falling water. They are built with a series of riffles and pools in the constructed channel, and a rocked floodplain that would carry over-banking flood flows. The Reid Dam structure would require 4,000 cubic yards of rock, and the Shea Dam would require 2,800 cubic yards. Transporting these large volumes of rock would render a project prohibitively expensive without a nearby source. Some rock and transportation were donated to the project in 2010 by CC Meyers, Inc., and is now stockpiled five miles from the project site. All applicable environmental clearance and permits have been obtained for the project to date (pending additional bank swallow provisions from the California Department of Fish and Game at the Hansen/Shea/Labbe reach). Construction work would entail the use of an excavator, a track loader, transportation of rock, and a water truck; as well as follow-up re-vegetation and noxious weed removal in the first two years after construction. Each treatment area would require a temporary flow bypass channel and coffer dams to de-water the construction area and protect</p>
<b>Total Requested Amount</b>	341,000.00
<b>Other Fund Proposed</b>	28,100.00
<b>Total Project Cost</b>	369,100.00
<b>Project Category</b>	Site Improvement/Restoration
<b>Project Area/Size</b>	13.6
<b>Project Area Type</b>	Acres
<b>Have you submitted to SNC this fiscal year?</b>	No
<b>Is this application related to other SNC funding?</b>	No

<b>Project Results</b>
Restoration
Resource protection

<b>Project Purpose</b>	<b>Project Purpose Percent</b>
Habitat	
Natural Resource	
Water Quality	

<b>County</b>
Plumas

<b>Sub Region</b>
North Central

**PROJECT CONTACT INFORMATION**

<b>Name</b>	Ms. Leslie Mink,
<b>Title</b>	Project Manager
<b>Organization</b>	Plumas Corporation
<b>Primary Address</b>	Greenhorn Creek 48186, , Quincy, CA, 95971
<b>Primary Phone/Fax</b>	530-283-3739 <b>Ext.</b>
<b>Primary Email</b>	leslie@plumascounty.org



## PROJECT LOCATION INFORMATION

### Project Location

Address:	none, , , near Quincy, CA, 95971 United States
Water Agency:	Quincy Community Services Distrct
Latitude:	39.950
Longitude:	-120.833
Congressional District:	n/a
Senate:	n/a
Assembly:	n/a
Within City Limits:	No
City Name:	

ADDITIONAL INFORMATION

Grant Application Type

**Grant Application Type:**  
**Category One Site Improvement**

**Grant Application Type:**  
**Category One Site Improvement**

<b>PROJECT OTHER CONTACTS INFORMATION</b>
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<b>Other Grant Project Contacts</b>
Name: Gia Martynn, Project Role: Day-to-Day Responsibility Phone: 5302833739 Phone Ext: E-mail: gia@plumascounty.org

## UPLOADS

The following pages contain the following uploads provided by the applicant:

Upload Name
Completed Application Checklist
Table of Contents
Full Application Form
Authorization to Apply or Resolution
Narrative Descriptions
CEQA Documentation
CEQA Documentation
NEPA Documentation
Detailed Budget Form
Regulatory Requirements or Permits
Letters of Support
Long Term Management Plan
Project Location Map
Parcel Map Showing County Assessors Parcel Number

Topographic Map
Photos of the Project Site
Land Tenure- Only for Site Improvement Projects
Site Plan - Only Site Improv. or Restoration Proj.
Detailed Budget Form

To preserve the integrity of the uploaded document, headers, footers and page numbers have not been added by the system.

Instructions for use of this form:

1. Scroll down and check the box indicating completion of requested information in the appropriate format.

- You can move among the boxes by using your mouse or the "Tab" key.

2. When you have completed the form, print and sign at the bottom.

*Please note: Adobe® Reader® does not allow you to save your work. It is very important that you print out your form immediately after completing it.*

## Appendix B1

### Full Application Checklist

Project Name: Greenhorn Creek Integrated restoration Project EG ID#: 694

Applicant: Plumas Corporation

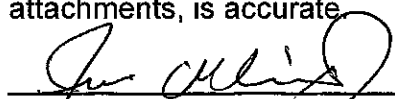
Please mark each box: check if item is included in the application; mark "N/A" if not applicable to the project. "N/A" identifications must be explained in the application. Please consult with SNC staff prior to submission if you have any questions about the applicability to your project of any items on the checklist. All applications must include a CD including an electronic file of each checklist item, if applicable. The naming convention for each electronic file is listed after each item on the checklist. (Electronic File Name = EFN: "naming convention". file extension choices)

Submission requirements for all Category One and Category Two Grant Applications

- ☐ Completed Application Checklist (EFN: *Checklist.pdf*)
- ☐ Table of Contents (EFN: *TOC.doc or .docx*)
- ☐ Full Application Project Information Form (EFN: *fapi.doc or .docx*)
- ☐ Authorization to Apply or Resolution (EFN: *authorization.doc or .docx*)
- ☐ Narrative Descriptions - Submit a single document (maximum 10 pages, Arial 12 pt font, 1 inch margins) that includes each of the following narrative descriptions (EFN: *Narrative.doc or .docx*)
  - ☐ Detailed Project Description
    - ☐ Project Description including Goals/Results, Scope of Work, Location, Purpose, etc.
    - ☐ Project Summary
    - ☐ Environmental Setting
  - ☐ Workplan and Schedule
  - ☐ Restrictions, Technical/Environmental Documents and Agreements – Category 1 projects only
  - ☐ Organizational Capacity

- e. ☒ Cooperation and Community Support
  - f. ☒ Long Term Management and Sustainability
  - g. ☒ Performance Measures
6. Supplemental and Supporting documents
- a. ☒ CEQA/NEPA Compliance Form (EFN: CEQAform.doc or .docx)
    - ☒ California Environmental Quality Act (CEQA) documentation (EFN: CEQA.pdf)
    - ☒ National Environmental Policy Act (NEPA) documentation (EFN: NEPA.pdf)
  - b. ☒ Detailed Budget Form (EFN: Budget.xls, .xlsx)
  - c. Restrictions, Technical/Environmental Documents and Agreements, as applicable
    - Category 1 projects only
    - ☐ Restrictions / Agreements (EFN: RestAgree.pdf) *there are no restricting agreements*
    - ☒ Regulatory Requirements / Permits (EFN: RegPermit.pdf)
  - d. Cooperation and Community Support
    - ☒ Letters of Support (EFN: LOS.doc, .docx or .pdf)
  - e. Long-Term Management and Sustainability
    - ☒ Long-Term Management Plan (EFN: LTMP.pdf)
  - f. Maps and Photos
    - ☒ Project Location Map (EFN: LocMap.pdf)
    - ☒ Parcel Map showing County Assessor's Parcel Number(s) (EFN: ParcelMap.pdf)
    - ☒ Topographic Map (EFN: Topo.pdf)
    - ☒ Photos of the Project Site (10 maximum) (EFN: Photo.jpg, .gif)
  - g. Additional submission requirements for Conservation Easement Acquisition applications only
    - ☐ Acquisition Schedule (EFN: acqSched.doc, .docx, .rtf, .pdf)
    - ☐ Willing Seller Letter (EFN: WillSell.pdf)
    - ☐ Real Estate Appraisal (EFN: Appraisal.pdf)
    - ☐ Conservation Easement Language (EFN: CE.pdf)
    - ☐ Third Party Transfer Acknowledgment Letter (if applicable) (EFN: Transfer.pdf)
  - h. Additional submission requirements for Site Improvement / Restoration Project applications only
    - ☒ Land Tenure Documents – attach only if documentation was not included with Pre-application (EFN: Tenure.pdf)
    - ☒ Site Plan (EFN: SitePlan.pdf)
    - ☐ Leases or Agreements (EFN: LeaseAgmnt.pdf) *there are none.*

I certify that the information contained in the Application, including required attachments, is accurate.

  
 Signed \_\_\_\_\_  
 (Authorized Representative)

10/18/12  
 Date

James Wilcox, Jr.  
 Interim Administrative Coordinator

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Instructions for use of this form:

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## Appendix B2

### Project Information Form

**PROJECT NAME** (Limit name to 10 words or less)

**EGID#** 694

Greenhorn Creek Integrated Restoration Project

**APPLICANT NAME** (Legal name, address, and zip code)

Plumas Corporation 550 Crescent St Quincy, CA 95971

**PROJECT DESCRIPTION:** Refer to Sec. IV, 5a in the GAP.

Has the project description been updated from the project description submitted with the Pre-Application form? (Choose One) ☐ SAME ☒ UPDATED

#### CONSISTENCY WITH LOCAL GENERAL PLAN

Is this project consistent with the appropriate jurisdiction's (city/county) general plan?

☒ Yes ☐ No (If not, explain why not.)

#### WILLIAMSON ACT STATUS (for conservation easement acquisition projects only)

Is the project enrolled in a Williamson Act contract with the local county? ☐ Yes ☐ No

If yes, what is the expiration date of the contract? This is not a conservation easement project

#### FUNDING AND BUDGET INFORMATION

SNC Grant Request \$ 341,000

☐ Check if SNC is the sole funder of this project

#### PERSON WITH FISCAL MANAGEMENT RESPONSIBILITY FOR GRANT CONTRACT/INVOICING

Name and title – type or print

Phone

Email Address

☐ Mr.

☒ Ms. Gia Martynn, Watershed Coordinator 530-283-3739 gia@plumascounty.org

**PERSON WITH DAY-TO-DAY RESPONSIBILITY FOR GRANT** (Only include this information if different from pre-application submittal)

Name and title – type or print

Phone

Email Address

☐ Mr. same as pre-app

☐ Ms.

**COUNTY ADMINISTRATOR OR PLANNING DIRECTOR CONTACT INFORMATION** (*At least one entry with Email address is REQUIRED*)

Name: Randy Wilson, Planning Director

Phone Number: 530-283-6214

Email Address: randywilson@countyofplumas.com

Name:

Phone Number:

Email Address:

**NEAREST PUBLIC WATER AGENCY (OR AGENCIES) CONTACT INFORMATION** (*At least one entry with Email address is REQUIRED*)

Name: Quincy Community Services District

Phone Number: 530-283-0836

Email Address: qcscmail@psln.com

Name: East Quincy Services District

Phone Number: 530-283-2390

Email Address: maineastquincycsd.com

**Please identify the appropriate project category below and provide the associated details** (*Choose One – should be the same as the category identified in the pre-application*)

☒ Category One Site Improvement

☐ Category Two Pre-Project Activities

☐ Category One Conservation Easement Acquisition

☐ **Site Improvement/Conservation Easement Acquisition**

Project Area: \_\_\_\_\_

Total Acres: 21 acres

SNC Portion (if different): 13.6 acres

Total Miles (i.e. river or stream bank): 0.7 mi

SNC Portion (if different): 0.5 miles

**For Conservation Easement Acquisitions Only**

☐ Appraisal Included

☐ Will submit appraisal by \_\_\_\_\_

**Select one primary Site Improvement/Conservation Easement Acquisition deliverable**

☒ Stream Restoration/Protection

☐ Management Practices Changes

☐ Natural Resource Protection

☐ Infrastructure Development/Improvement

☐ Conservation Easement

**Does the applicant intend to transfer the easement to a third party?** ☐ Yes ☐ No

If yes, is the third party organization known? ☐ Yes ☐ No If yes, please attach a letter from this organization documenting their willingness to assume the long term management of the project.

☐ **Pre-Project Activities**

**Select one primary Pre-Project deliverable**

☐ Permit

☐ Condition Assessment

☐ CEQA/NEPA

☐ Biological Survey

☐ Appraisal

☐ Environmental Site

☐ Plan

Assessment



## Board of Directors Resolution # 2012-04

In the matter of: A RESOLUTION APPROVING THE APPLICATION FOR GRANT FUNDS FOR THE <b>Greenhorn Creek Integrated Restoration Project</b>  GRANT PROGRAM UNDER THE <b>Sierra Nevada Conservancy</b>	Resolution No: <b>2012-04</b>  Date: <b>9-5-12</b>
---	--

The following RESOLUTION was duly passed by the Board of Directors of the **Plumas Corporation** at a regular meeting held **September 5, 2012**, by the following vote:

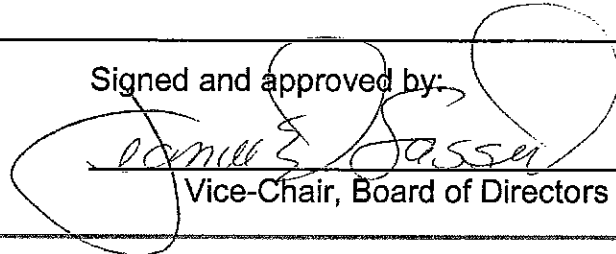
Ayes: Sasser, Olofson, De Lasaux

Noes: \_\_\_\_\_

Abstentions: Reid

Absent: \_\_\_\_\_

Signed and approved by:

  
Vice-Chair, Board of Directors

WHEREAS, the Legislature and Governor of the State of California have provided Funds for the program shown above; and

WHEREAS, the Sierra Nevada Conservancy (SNC) has been delegated the responsibility for the administration of a portion of these funds through a local assistance grants program, establishing necessary procedures; and

WHEREAS, said procedures established by the Sierra Nevada Conservancy require a resolution certifying the approval of application(s) by the Applicant's governing board before submission of said application(s) to the SNC; and

WHEREAS, the Applicant, if selected, will enter into an agreement with the SNC to carry out the project; and

WHEREAS, the **Plumas Corporation** has identified the **Greenhorn Creek Integrated Restoration Project** as valuable toward meeting its mission and goals.

BE IT HEREBY RESOLVED by the Board of Directors of the **Plumas Corporation** that this Board:

- Approves the submittal of an application for the **Greenhorn Creek Integrated Restoration** project; and
- Certifies that Applicant understands the assurances and certification requirements in the application; and
- Certifies that Applicant or title holder will have sufficient funds to operate and maintain the resource(s) consistent with the long-term benefits described in support of the application; or will secure the resources to do so; and
- Certifies that Applicant will comply with all legal requirements as determined during the application process; and
- Appoints **Jim Wilcox**, or designee, as agent to conduct all negotiations, execute and submit all documents, including but not limited to: applications, agreements, payment requests, and so on, which may be necessary for the completion of the aforementioned project(s).

PASSED AND ADOPTED by the **Plumas Corporation** on the **5<sup>th</sup>** day of **September**, **2012**.

## **Greenhorn Creek Integrated Restoration Project Proposal Narrative**

### **a. Detailed Project Description**

**Project Description:** This project addresses channel erosion, fish passage barriers, and loss of agricultural productivity along Greenhorn Creek in American Valley near the town of Quincy. Land use along the channel is primarily agricultural. The project seeks to improve water quality and trout productivity by stabilizing actively eroding areas of stream bank and streambed, and restoring fish passage at two agricultural diversion dams. These actions will also stem the on-going loss of agricultural land to bank erosion, and protect the two diversion dams from failure. The Greenhorn Creek Integrated Restoration Project is comprised of six treatment areas along Greenhorn Creek in American Valley, totaling 21 acres and 3,633 feet of stream channel. One of the six treatment areas was constructed in October 2011. This application seeks funding for construction at four of the other five treatment areas. The SNC funding would treat 13.6 acres of aquatic and riparian habitat and 2,720 feet of channel. The fifth treatment area would address bed stabilization at a bridge, and would be constructed using landowner funds, however, it is not certain that the landowners will fund the work. Because the bridge is only marginally associated with agriculture, and implementation is uncertain, this treatment is not requested for funding, is not included as match, and will not be discussed further.

Of the four treatment areas in need of SNC funding, two address bank stabilization, and two address fish passage and irrigation dam stabilization. The two bank stabilization treatment areas (Farnworth & Hansen/Shea/Labbe) would involve laying back 6-8 feet high eroding banks to a 2:1 slope, vegetating the banks and installing boulder vanes. (Boulder vanes are a line of boulders set at floodplain elevation and angled upstream. The vanes maintain flow vectors in the center of the channel, induce deposition along the bank, and maintain pool depth through scouring action.) The 2.8 acre Farnworth treatment area would treat 220 feet of bank and install 30 cubic yards of boulders in two vanes. The Hansen/Shea/Labbe treatment area would stabilize 900 to 1,800 feet of channel and install 220 to 435 cubic yards of boulders in 10 to 20 vanes. Uncertainty with treatment at this location is due to the recent occupation of one of the eroding banks by bank swallows, a California threatened species. Pre-construction surveys and close coordination with the California Department of Fish and Game will determine the final degree of treatment in this area. Bank swallows require freshly eroding streambanks for nesting. Thus, bank stabilization has contributed to their decline. Treatment goals on the Hansen/Shea/Labbe reach include the protection of bank swallows as well as meeting landowner goals of reducing erosion as much as possible.

The two fish passage treatments are located at agricultural irrigation dams, both of which are in danger of collapse. Bed erosion below both of these dams has created

impassable fish barriers, and is undermining the bed on which the dams are built. Loss of these dams would be catastrophic for both Greenhorn Creek and the irrigators. The irrigators would lose substantial productivity from their irrigated pastures, and the channel would be subject to severe head-cutting, which would also lead to drying of the meadow (and subsequent loss of irrigation efficiency). Just above the dams, the channel bed is still at an elevation where flood flows can access the floodplain. On-going bed erosion has created an abrupt drop of eight feet at these dams to date. Treatment would consist of rock channel and floodplain structures that would stabilize the bed, allow upstream fish migration, and protect the dams. The structures would be constructed at a 5% grade. The structures are designed to require no maintenance, allow fish passage, and dissipate the energy of falling water. They are built with a series of riffles and pools in the constructed channel, and a rocked floodplain that would carry over-banking flood flows. The Reid Dam structure would require 4,000 cubic yards of rock, and the Shea Dam would require 2,800 cubic yards. Transporting these large volumes of rock would render a project prohibitively expensive without a nearby source. Some rock and transportation were donated to the project in 2010 by CC Meyers, Inc., and is now stockpiled five miles from the project site.

All applicable environmental clearance and permits have been obtained for the project to date (pending additional bank swallow provisions from the California Department of Fish and Game at the Hansen/Shea/Labbe reach). Construction work would entail the use of an excavator, a track loader, transportation of rock, and a water truck; as well as follow-up re-vegetation and noxious weed removal in the first two years after construction. Each treatment area would require a temporary flow bypass channel and coffer dams to de-water the construction area and protect water quality and aquatic life during construction. In the fish passage treatment areas, irrigation ditches would be used to bypass the flow; a temporary channel would be excavated (and re-contoured after construction) in the other two treatment areas. While the work at each treatment area would benefit Greenhorn Creek in an integrated manner, completion of work at each treatment area is independent of work at any other treatment area. If the project is only partially funded, priority would be given to the fish passage treatments at the diversion dams.

This project has been under development since 2007, beginning with a request for assistance with erosion problems by several agricultural landowners. Topographic surveys and design work were completed with a planning grant from the Plumas County Board of Supervisors and funding from the Shea Ranch. The Plumas County Resource Advisory Committee funded completion of environmental review for the entire project, and construction on the Forest Service and Reid Ranch parcels in 2011. The project has undergone extensive public review through both the CEQA and NEPA processes, as well as two public meetings outside of those processes. Public benefit of the project

includes improved water quality from the elimination of 2,020 feet of eroding banks as a source of sediment, and improved trout habitat in the form of boulder vane pools, shading on stream banks, and upstream migration passage. The project would also help maintain productivity on agricultural lands that are now being lost to bank erosion. It would simultaneously improve irrigation dam stability and restore upstream fish passage past the dams.

**Project Summary:** This project would lay back and stabilize approximately 2,020 feet of actively eroding stream bank, and restore fish passage at two irrigation dams (stabilizing 700 feet of channel bed). The expected outcomes are improved trout habitat, improved water quality, and reduced bank erosion. Deliverables would be 1,120 to 2,020 feet of constructed bank stabilization and two fish passage structures on 700 feet of channel.

**Environmental Setting:** The project area is within American Valley. The town of Quincy is on the south side of the valley, and a few ranches surrounded by low density hill-slope housing developments occupy the rest of the valley. The project is located on the north side of the valley, where Greenhorn Creek flows through American Valley. The ranches mainly produce cattle, horses and hay. The project is consistent with Plumas County zoning for Agricultural Preserve, General Agriculture, Secondary Suburban, Floodplain, and Special Plans for Scenic Area and Scenic Road.

#### **b. Workplan and Schedule**

The Scope of Work is to construct bank stabilization at two locations and fish passage at two locations. Work is scheduled for early fall over two years, to coincide with the lowest possible stream flow. Please note that the Stormwater Construction General Permit cannot be obtained until just before construction begins. The county grading permit has also been applied for, but also cannot be issued until a contractor has been identified. The work plan and schedule would be as follows:

<b>Detailed Project Deliverables</b>	<b>Timeline</b>
Rock size engineering review	July 1-14, 2013
Pre-project monitoring data collection	July - September 2013
Construction contract advertised and awarded	July – August 2013
County grading permit received	August 2013
Stormwater Construction General Permit (CGP) documents registered	September 1, 2013



Detailed Project Deliverables	Timeline
Shea/Hansen/Labbe Reach construction	September 15-October 9, 2013
Shea Ranch fish passage construction	October 9-31, 2013
First six month progress report to SNC	December 31, 2013
CGP terminated for 2013 construction	June 2014
Second six month progress report to SNC	June 30, 2014
CGP documents registered	August 15, 2014
Farnworth reach construction	September 1-9, 2014
Reid dam fish passage construction	September 10-30, 2014
Third six month progress report to SNC	December 31, 2014
Revegetation where needed	May 2015
CGP terminated for 2014 construction	June 2015
Fourth six month progress report to SNC	June 30, 2015
Post-project monitoring data collection	July – September 2015
Final Report to SNC	December 2015

### **c. Restrictions, Technical/Environmental Documents and Agreements**

There are no property restrictions and/or encumbrances that would adversely impact project planning. The extent to which banks can be treated in the Hansen/Shea/Labbe reach will be determined by on-going consultation with the California Department of Fish and Game. There is no known toxicity associated with any of the treatment sites. The proposed treatments are located entirely on private agricultural lands. Plumas County issued a grading permit for the bank work completed in 2011. The rest of the permit will be issued when the engineering review has been approved and a construction contract has been awarded.

Permits for this project include: California Department of Fish and Game Streambed Alteration Agreement, Regional Water Quality Control Board 401 Water Quality Certification, Plumas County Grading Permit, Army Corps of Engineers Nationwide 27 Permit (includes consultation with State Historic Preservation Office), and coverage under California's Storm Water Construction General Permit (CGP). All applicable permits that have been obtained are attached to this grant application. Please note that standard procedure for coverage under the CGP is to submit Permit Registration

Documents no more than 14 days before construction. Standard procedure for the county grading permit is to withhold the permit until a contractor is identified. Plumas Corporation will not enter into a construction contract without funding.

**d. Organizational Capacity**

Plumas Corporation staff designed the project and would oversee the construction. Collectively, staff have over 80 years of restoration experience, including design, environmental analysis, funding, and construction. All projects are reviewed by a Technical Advisory Committee comprised of natural resource and engineering professionals from partner agencies of the Feather River Coordinated Resource Management Group.

Four staff members would be involved with this project. Leslie Mink, Project Manager; and Jim Wilcox, Program Manager, each have over 20 years of experience in all aspects of restoration project implementation. Gia Martynn, Watershed Coordinator, has been with Plumas Corp since 2005 and has administered over 20 projects. Kara Rockett, Monitoring Coordinator, has worked at Plumas Corp since 2008, and has monitored and reported on 10 projects.

**e. Cooperation and Community Support**

This project has been in the planning and development phases since 2007. Plumas Corporation was approached by several landowners requesting assistance with bank erosion and an unstable irrigation dam. Project planning involved all landowners along Greenhorn Creek in American Valley. There have been public meetings regarding the project, and it enjoys broad public support, including irrigators on Greenhorn Creek. Contributions to the project have been received from Plumas County Board of Supervisors, Plumas National Forest and the Resource Advisory Committee (RAC), Shea Ranch, and a construction firm.

The Feather River Coordinated Resource Management partnership has recently undergone local criticism regarding pond and plug treatments. No pond and plug is associated with this project.

**f. Long-term Management and Sustainability**

All of the treatment areas are on agricultural private lands along the riparian corridor. The landowners have been concerned with bank and bed erosion for over a decade, and are keenly interested in maintaining the function of the proposed treatments that would restore some stability to their properties. The Plumas County General Plan allows no building construction in these areas, so that the project area will continue to provide riparian habitats. The treatments are designed to require no maintenance. The primary concept with the boulder vanes is to convert the horizontal energy dissipation of

increased meander development (i.e. bank erosion) into vertical energy dissipation with pool maintenance. As vegetation grows on the sloped banks, stability increases every year. The fish passage structures are designed to mimic natural channels. These are massive rock structures that transition abrupt channel elevation differences in controlled, fish-passable steps. They are expensive to build, but are expected to last indefinitely, unlike traditional fish ladders that require maintenance and have a finite life expectancy. Both of these techniques have been used successfully in the Feather River watershed since 2001. The project landowner agreement that clarifies project protection and maintenance is included with this grant application.

#### **g. Performance Measures**

SNC performance measures would be applied to the project as follows:

- 1) Number & diversity of people reached: These are the landowners that live along the channel as well as the greater community that will see the treatments.
- 2) Value of resources leveraged for the Sierra Nevada: These would include cash and in-kind contributions toward planning, implementation, and monitoring.
- 3) Number and type of jobs created: This would be measured by funded staff hours and sub-contractors hired when construction funding is secured.
- 4) Number of new, improved, or preserved economic activities: This would be measured by assessing the value of land protected by erosion.
- 6) Linear feet of streambank protected or restored: Linear feet of streambank restored would be measured.
- 13) Acres of land improved or restored: Treatment acreages would be reported under natural resource protection, water quality, and aquatic and riparian habitats. Healthy montane riparian habitat in meadows is a limited habitat in the Sierra Nevada. Water quality and aquatic habitat quality parameters such as temperature, sedimentation, bank stability and depth would be monitored and reported following Forest Service Region Five Stream Condition Inventory protocols.

#### **h. Budget Narrative**

This project seeks to achieve bank stabilization within the constraints of existing land uses, which requires that treatments stay within the confines of the existing gullied stream channel. Bank stabilization in this setting requires rock because the erosional forces of high flows confined within a gully are much greater than those forces would be if they could spread out over their naturally evolved floodplain. The resistance of large rock can re-directs flows away from banks. By restoring the channel bed elevation with massive rock structures at the fish passage treatments, three problems are dealt with: 1) additional bed erosion below the irrigation dams would be eliminated; 2) the irrigation dams would be reinforced so that they do not fail and can continue to support agriculture, and maintain the channel bed elevations above the dams; and 3) fish will be

able to migrate upstream past the dams and access good quality spawning habitat. Use of rock in the design of these treatments is necessary to ensure the success of the project, as well as its longevity.

The transport of rock is expensive, and there is no source of rock near the project area. Plumas Corporation partnered with CC Meyers to donate some rock and transport to American Valley near the project area. Without this donation, the project would be prohibitively expensive. However, more rock of an appropriate size is needed to securely anchor the smaller donated rock. Most of the cost of this project is for the transport and placement of rock. Plumas National Forest will donate most of the rest of the rock, however, the source is about 40 miles away.

Situated near the town of Quincy, Greenhorn Creek is a popular local trout fishery, and the project has broad local support. The Plumas County Board of Supervisors funded project planning (\$23,000), with Secure Rural Schools Title III monies. The Shea Ranch also provided \$5,000 for survey work. The Plumas National Forest through the Resource Advisory Committee provided \$70,360 for construction at one of the six project treatment areas, as well as completion of environmental work for all of the treatment areas (construction at this site was completed in October 2011). CC Meyers, Inc. contributed \$98,000 worth of rock and transport, which would be used for the fish passage treatments. The Plumas National Forest has also committed to provide 1,500 cubic yards of boulders for the project (at \$15/ yd = \$22,500). The New England Ranch Shea Ranch, and Reid Ranch will contribute a combined \$5,600 for final engineering review.

Cost savings in project construction would be realized in the following ways:

- use of the above mentioned donations of rock and transport
- the construction supervisor also operating a piece of equipment, and conducting permit compliance monitoring
- the use of a water pump rather than a water truck.

# Appendix B4

## SIERRA NEVADA CONSERVANCY

### PROPOSITION 84 - DETAILED BUDGET FORM

Project Name: Greenhorn Creek Integrated Restoration Project

Applicant: Plumas Corporation

SECTION ONE				Project Cost Breakdown				
DIRECT COSTS	Units	Unit Cost	Total Cost	Year One (2013)	Year Two (2014)	Year Three (2015)	Year Four (2016)	Total
Heavy Equipment Contract:								\$0.00
Excavator hours	640	\$190.00	\$121,600.00	\$64,083.20	\$57,516.80			\$121,600.00
Track loader hours	310	\$135.00	\$41,850.00	\$2,205.50	\$39,644.50			\$41,850.00
20 yd end dump truck hours	1,016	\$105.00	\$106,680.00	\$56,220.36	\$50,459.64			\$106,680.00
Boulders - tons	430	\$40.00	\$17,200.00		\$17,200.00			\$17,200.00
BMP supplies	20	\$100.00	\$2,000.00	\$1,000.00	\$1,000.00			\$2,000.00
Construction Supervision*, Equipment Operation, Compliance Monitoring hourly	330	\$62.00	\$20,460.00	\$10,782.42	\$9,677.58			\$20,460.00
Vegetation Follow-up hours	100	\$41.00	\$4,100.00	\$2,160.70	\$1,939.30			\$4,100.00
<b>DIRECT COSTS SUBTOTAL:</b>	<b>2,846</b>	<b>\$673.00</b>	<b>\$313,890.00</b>	<b>\$136,452.18</b>	<b>\$177,437.82</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$313,890.00</b>

SECTION TWO				Project Cost Breakdown				
INDIRECT COSTS	Units	Unit Cost	Total Cost	Year One	Year Two	Year Three	Year Four	Total
Effectiveness Monitoring hours	64	\$34.44	2,204.16	\$1,102.08	\$1,102.08			\$2,204.16
Reporting hours	80	\$40.18	3,214.40	\$1,607.20	\$1,607.20			\$3,214.40
<b>INDIRECT COSTS SUBTOTAL:</b>	<b>144</b>	<b>\$74.62</b>	<b>\$5,418.56</b>	<b>\$2,709.28</b>	<b>\$2,709.28</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$5,418.56</b>
<b>PROJECT TOTAL:</b>	<b>2,990</b>	<b>\$747.62</b>	<b>\$319,308.56</b>	<b>\$139,161.46</b>	<b>\$180,147.10</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$319,308.56</b>

SECTION THREE				Project Cost Breakdown				
Administrative Costs (Costs may not to exceed 15% of total Project Cost) :	Units	Unit Cost	Total Cost	Year One	Year Two	Year Three	Year Four	Total
Heavy Equipment Contract Admin			\$792.00	\$396.00	\$396.00			\$792.00
Construct Supervision hourly overhead*	330	\$57.00	\$18,810.00	\$9,912.87				\$18,810.00
Monitoring Coordinator hourly overhead	64	\$7.56	\$483.84	\$241.92	\$241.92			\$483.84
Watershed Coordinator hourly overhead	80	\$8.82	\$705.60	\$352.80	\$352.80			\$705.60
Vegetation follow-up hourly overhead	100	\$9.00	\$900.00	\$450.00	\$450.00			\$900.00
<b>ADMINISTRATIVE TOTAL:</b>	<b>474</b>	<b>\$73.38</b>	<b>\$21,691.44</b>	<b>\$11,353.59</b>	<b>\$990.72</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$21,691.44</b>
<b>SNC TOTAL GRANT REQUEST:</b>	<b>3,464</b>	<b>\$821.00</b>	<b>\$341,000.00</b>	<b>\$150,515.05</b>	<b>\$181,137.82</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$341,000.00</b>

SECTION FOUR			Funded pre-project	Years Fund Received				
OTHER PROJECT CONTRIBUTIONS				Year One	Year Two	Year Three	Year Four	Total
<i>List other funding or in-kind contributors to project (i.e. Sierra Business Council, Department of Water Resources, etc.)</i>								
Plumas County Board of Supervisors			\$23,000.00					\$0.00
Shea Ranch			\$5,000.00					\$0.00
Plumas National Forest Resource Advisory Committee			\$70,360.00					\$0.00
CC Meyers			\$98,000.00					\$0.00
Plumas National Forest (1,500 cu yds boulders)			\$22,500.00	\$13,500.00	\$9,000.00			\$22,500.00
New England Ranch**			\$1,600.00	\$1,600.00				\$1,600.00
Shea Ranch**			\$2,000.00	\$2,000.00				\$2,000.00
Reid Ranch**			\$2,000.00	\$2,000.00				\$2,000.00
<b>Total Other Contributions:</b>	<b>0</b>	<b>\$0.00</b>	<b>\$224,460.00</b>	<b>\$19,100.00</b>	<b>\$9,000.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$28,100.00</b>

\*includes required prevailing wage and workmen's comp rates

\*\* Landowners' contributions to final engineering costs

Notes:

Indirect costs on this chart were defined by SNC staff via phone as costs that are not a component of construction.

Please note that Plumas Corporation's definition of "indirect costs" on the attached cost allocation plan correspond to administrative costs in this chart.

Plumas Corporation  
**INDIRECT COST ALLOCATION PLAN**

The method of Indirect cost allocation used by the Plumas Corporation was established in 1992. This Indirect Cost Plan conforms with OMB Circular A-122. Indirect costs incurred benefiting two or more programs operated by Plumas Corporation and not identified as costs to a specific program are allocated according to the following line items:

**Personnel**

Portions of the Executive Director salary and the Administrative Assistant salary are annually budgeted and then charged monthly to the general administration of the Corporation. This percentage is established annually in the budget development process and then allocated by the actual hours spent on overall corporate matters. For example in FY 12-13, the executive director was budgeted at 6% to indirect and the administrative assistant at 30% to indirect. FY12-13 budget allocates a total of 740 personnel hours to indirect costs.

**Fringe Benefits**

For the above personnel

**Travel**

Indirect travel is to meetings, seminars or workshops where the entire organization is to be represented. This travel also includes check signing and other corporate errands.

**Equipment Maintenance -**

All copying and computer maintenance.

**Dues and Subscriptions**

Overall corporate only

**Repairs and Maintenance**

Overall corporate only

**Depreciation**

Corporate owned equipment

**Equipment**

Lease and purchase costs for corporate equipment

**Utilities**

**Office electric, gas and water**

**Telephone**

**General Corporate phone, fax and internet equipment and monthly costs. Does not include long distance conference calls attributable to a specific program.**

**Office Rent**

**Rent costs for land and building. Significant building equipment upgrades or repairs (e.g. air conditioner compressor replacement in 2009) are amortized over an appropriate time period and costed as a rent payment.**

**Postage**

**General corporate only.**

**Insurance**

**Corporate liability, fidelity, Directors and Officers insurance premiums. Professional liability insurance is charged as a direct program cost and only to those employees and activities that generate “ground disturbing” activities.**

**Personal Property Tax**

**County tax on corporate equipment**

**Accounting and Audit**

**Monthly CPA accounting expenses and annual Independent Audit**

**Miscellaneous and Miscellaneous professional services**

**Corporate items not otherwise defined**

**Material**

**General materials other than office supplies**

**Office Supplies**

**General office supplies not attributable to a specific program**

**General**

**Indirect costs are charged to a particular program only when direct hours are worked in the program. Indirect costs are reassigned to all programs based on total direct hours worked on a specific program. This is determined monthly, as the direct hours worked and expended per program are not necessarily consistent due to the small staff and the varying workload. The method of using direct hours is supported by time cards submitted by all employees for each pay period (semi-monthly) showing the hours worked**

on each program. In reallocating indirect costs to the various programs, indirect personnel costs are subtracted from the agency's total personnel costs before a percentage is determined for the allocation. This is done on a monthly basis in a consistent manner.

Annual budgeted indirect costs are averaged monthly at the initiation of the fiscal year. This monthly average indirect cost is assigned to the direct hours worked each month. The rationale for using an average allocation each month is that some significant indirect costs are not regular monthly costs (e.g. annual audit, liability insurance, annual meeting, etc.). Individual programs would be 'overcharged' if the non-recurring indirect expenditures appearing in a particular month were directly assigned only to the programs operational in that month. Adjustments in the overall indirect "pool" are made infrequently during the year (and finally adjusted to actual costs at year's end) when indirect expenses deviate significantly from budgeted amounts or significant changes in direct hours occur. These are applied to all operable programs as earlier defined.

#### **Annual Equations**

- Define budgeted percentage and hours and costs of indirect (GA) costs (salary and benefits) for staff involved in GA.
- Define and total all other budgeted GA costs, including above costs=GA (or indirect) budget.
- Determine total number of hours budgeted for all employees.
- Subtract from above all GA hours= Direct hours
- Divide total agency budget by GA budget= GA percentage (projected at 6% in FY 12-13)[for reference only, not for invoicing].
- Divide total agency budget less construction and non recurring costs= GA percentage of operations costs. (projected at 18% in FY 12-13). )[for reference only, not for invoicing].
- Divide GA total budget by Total Direct Hours= \$ GA allocation per direct hour. (For program budgeting purposes projected at \$10.00 in FY 12-13) This is the primary method of defining the allocation of GA costs to the various programs. In budgeting for new programs and in annual budgeting the dollar amount of GA allocation [e.g. \$10.00 in 2012-2013] is added to the direct employee's salary and benefit costs to arrive at a "blended hourly rate" for each employee. This blended rate is adjusted as necessary based on actual GA costs and actual direct hours worked on the individual and overall grants.

8-22-12





DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO CA 95814-2922

REPLY TO  
ATTENTION OF

July 26, 2012

Regulatory Division (SPK-2010-01482)

Leslie Mink  
Feather River Coordinated Resource Management  
Plumas Corporation  
P.O. Box 3880  
Quincy, California 95971-3880

Dear Ms. Mink:

We are responding to your July 06, 2012, request for a Department of the Army permit for the Integrated Greenhorn Restoration project. This approximately 2.2-acre project involves activities, including discharges of dredged or fill material, in waters of the United States to construct bank stabilization and restoration along 4,416 feet of bank using boulder vanes, vegetation, and bank sloping at three locations along the creek. Additionally the project proposes restoring fish passage at two dam locations. The restoration of fish passage at Shea Dam and Reid Dam will affect 800 feet of channel by raising the streambed with a riffle-pool structure using 8,000 cubic yards of 4'- pit run material from a nearby bridge replacement project. The project is located on or near Greenhorn Creek, Section 7, Township 24 North, Range 10 East, Mount Diablo Base and Meridian, Latitude 39.9472°, Longitude -120.8817°, Quincy, Plumas County, California.

Based on the information you provided, the proposed activity, resulting in the permanent impacts to approximately 1.887 acres and temporary impacts to .278 acres of perennial stream, is authorized by Nationwide Permit Number 27 Aquatic Habitat Restoration, Establishment, and Enhancement Activities. Your work must comply with the general terms and conditions listed on the enclosed Nationwide Permit information sheets and regional conditions, and the following special conditions:

Special Conditions

1. You and your authorized contractor shall allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that work is being or has been accomplished in accordance with the terms and conditions of this verification.
2. You shall notify this office of the start and completion dates for each phase of the authorized work within 5 calendar days prior to initiation of construction activities within waters of the U.S. and 30 calendar days following completion of construction activities.
3. Within 5 days prior to initiation of construction activities within waters of the United States, you shall submit to the Corps pre-construction site and aerial photographs of the project site,

which have been taken no more than 60 days prior to initiation of construction activities. Within 30 days following construction activities, you shall submit post-construction site and aerial photographs of the project site, showing the work conducted, to this office. The camera positions and view angles of post-construction photographs shall be identified on a map, aerial photo, or project drawing. Construction locations shall include all major project features and waters of the United States, including mitigation areas.

You must sign the enclosed Compliance Certification and return it to this office within 30 days after completion of the authorized work.

This verification is valid for two years from the date of this letter or until the Nationwide Permit is modified, reissued, or revoked, whichever comes first. Failure to comply with the General and Regional Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We would appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2010-01482 in any correspondence concerning this project. If you have any questions, please contact Matthew Kelley at Redding Regulatory Office, 152 Hartnell Avenue, Redding, California 96002, email [Matthew.P.Kelley@usace.army.mil](mailto:Matthew.P.Kelley@usace.army.mil), or telephone 530-223-9534. For more information regarding our program, please visit our website at [www.spk.usace.army.mil/Missions/Regulatory.aspx](http://www.spk.usace.army.mil/Missions/Regulatory.aspx).

Sincerely,



Matthew Kelley  
Chief, Redding Regulatory Office

Enclosure(s)

Copy Furnished without enclosure(s)

Mr. Dave Smith, US Environmental Protection Agency, 75 Hawthorne Street, San Francisco, California 94105

Mr. Scott Zaitz, Regional Water Quality Control Board, 415 Knollcrest Drive, Suite 100, Redding, California 96002



Linda S. Adams  
Acting Secretary for  
Environmental Protection

# California Regional Water Quality Control Board Central Valley Region

Katherine Hart, Chair

415 Knollcrest Drive, Suite 100, Redding, California 96002  
(530) 224-4845 • Fax (530) 224-4857  
<http://www.waterboards.ca.gov/centralvalley>



Edmund G. Brown Jr.  
Governor

27 July 2011

Ms. Leslie Mink  
Plumas Corporation – Feather River CRM  
P.O. Box 3880  
Quincy, CA 95971

## **CLEAN WATER ACT §401 TECHNICALLY CONDITIONED WATER QUALITY CERTIFICATION FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS FOR THE INTEGRATED GREENHORN CREEK RESTORATION PROJECT (WDID#5A32CR00090), QUINCY, PLUMAS COUNTY**

### **ACTION:**

1. ☐ Order for Standard Certification
2. ☒ Order for Technically-conditioned Certification
3. ☐ Order for Denial of Certification

### **WATER QUALITY CERTIFICATION STANDARD CONDITIONS:**

1. This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to §13330 of the California Water Code and §3867 of Title 23 of the California Code of Regulations (23 CCR).
2. This certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The validity of any non-denial certification action shall be conditioned upon total payment of the full fee required under 23 CCR §3833, unless otherwise stated in writing by the certifying agency.
4. Certification is valid for the duration of the described project. This certification is no longer valid if the project (as currently described) is modified, or coverage under Section 404 of the Clean Water Act has expired.

**ADDITIONAL TECHNICALLY CONDITIONED CERTIFICATION CONDITIONS:**

In addition to the four standard conditions, Plumas Corporation - Feather River CRM shall satisfy the following:

1. Plumas Corporation - Feather River CRM shall notify the Central Valley Regional Water Quality Control Board (Central Valley Water Board) in writing 7 days in advance of the start of any in-water activities.
2. Except for activities permitted by the U.S. Army Corps under §404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.
3. All areas disturbed by project activities shall be protected from washout or erosion.
4. Plumas Corporation - Feather River CRM shall maintain a copy of this Certification and supporting documentation (Project Information Sheet) at the Project site during construction for review by site personnel and agencies. All personnel (employees, contractors, and subcontractors) performing work on the proposed project shall be adequately informed and trained regarding the conditions of this Certification.
5. An effective combination of erosion and sediment control Best Management Practices (BMPs) must be implemented and adequately working during all phases of construction.
6. All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.
7. Plumas Corporation - Feather River CRM shall perform surface water sampling: 1) When performing any in-water work; 2) In the event that project activities result in any materials reaching surface waters or; 3) When any activities result in the creation of a visible plume in surface waters. The following monitoring shall be conducted immediately upstream out of the influence of the project and 300 feet downstream of the active work area. Sampling results shall be submitted to this office within two weeks of initiation of sampling and every two weeks thereafter. The sampling frequency may be modified for certain projects with written permission from the Central Valley Water Board.

Parameter	Unit	Type of Sample	Frequency of Sample
Turbidity	NTU	Grab	Every 4 hours during in water work
Visible construction related pollutants	Observations	Visible Inspections	Continuous throughout the construction period

8. Activities shall not cause turbidity increases in surface water to exceed:
- (a) where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTU;
  - (b) where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
  - (c) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
  - (d) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs;
  - (e) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

Except that these limits will be eased during in-water working periods to allow a turbidity increase of 15 NTU over background turbidity as measured in surface waters 300 feet downstream from the working area. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. Averaging periods may only be assessed by prior permission of the Central Valley Water Board.

9. Activities shall not cause settleable matter to exceed 0.1 ml/l in surface waters as measured in surface waters 300 feet downstream from the project.
10. The discharge of petroleum products or other excavated materials to surface water is prohibited. Activities shall not cause visible oil, grease, or foam in the work area or downstream. Plumas Corporation - Feather River CRM shall notify the Central Valley Water Board immediately of any spill of petroleum products or other organic or earthen materials.
11. Plumas Corporation - Feather River CRM shall notify the Central Valley Water Board immediately if the above criteria for turbidity, settleable matter, oil/grease, or foam are exceeded.
12. Plumas Corporation - Feather River CRM must comply with all requirements of U.S. Army Corps of Engineers Nationwide Permit Number 27 (Aquatic Habitat Restoration, Establishment, and Enhancement Activities), and special conditions for the project.
13. Plumas Corporation - Feather River CRM shall comply with all of the conditions of the California Department of Fish and Game Lake or Streambed Alteration Agreement for the project.
14. Plumas Corporation - Feather River CRM must obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board for any project disturbing an area of 1 acre or greater.

15. The Conditions in this water quality certification are based on the information in the attached "Project Information." If the information in the attached Project Information is modified or the project changes, this water quality certification is no longer valid until amended by the Central Valley Water Board.
16. In the event of any violation or threatened violation of the conditions of this Order, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under State law and section 401 (d) of the federal Clean Water Act. The applicability of any State law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with this Order.
  - a. If Plumas Corporation - Feather River CRM or a duly authorized representative of the project fails or refuses to furnish technical or monitoring reports, as required under this Order, or falsifies any information provided in the monitoring reports, the applicant is subject to civil monetary liabilities, for each day of violation, or criminal liability.
  - b. In response to a suspected violation of any condition of this Order, the Central Valley Water Board may require Plumas Corporation - Feather River CRM to furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
  - c. Plumas Corporation - Feather River CRM shall allow the staff of the Central Valley Water Board, or their authorized representative, to enter the project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this certification and determining the ecological success of the project.

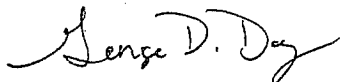
**REGIONAL WATER QUALITY CONTROL BOARD CONTACT PERSON:**

Guy F. Chételat, P.G., Redding Branch Office, 415 Knollcrest Drive, Suite 100, Redding, California 96002, gchetelat@waterboards.ca.gov, (530) 224-4997

**WATER QUALITY CERTIFICATION:**

I hereby issue an order certifying that any discharge from Plumas Corporation - Feather River CRM, Integrated Greenhorn Creek Restoration Project (WDID# 5A32CR00090) will comply with the applicable provisions of §301 ("Effluent Limitations"), §302 ("Water Quality Related Effluent Limitations"), §303 ("Water Quality Standards and Implementation Plans"), §306 ("National Standards of Performance"), and §307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Resources Control Board Water Quality Order No. 2003-0017 DWQ "Statewide General Waste Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification (General WDRs)".

Except insofar as may be modified by any preceding conditions, all certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with Plumas Corporation - Feather River CRM's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the Water Quality Control Plan *for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009.



(for) Pamela C. Creedon  
Executive Officer

Enclosure: Project Information

GFC: wrb/knr

cc: Mr. Matt Kelley, U.S. Army Corp of Engineers, Redding  
U.S. Fish and Wildlife Service, Sacramento  
Ms. Donna Cobb, Department of Fish and Game, Region 1, Redding  
Mr. Bill Jennings, CALSPA, Stockton

cc by email: Mr. Dave Smith, U.S. EPA, Region 9, San Francisco  
Mr. Bill Orme, SWRCB, Certification Unit, Sacramento

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## PROJECT INFORMATION

**Application Date:** 15 June 2011

**Applicant:** Plumas Corporation - Feather River CRM, Attn:

**Applicant Representatives:** Not Applicable

**Project Name:** Integrated Greenhorn Creek Restoration Project

**Application Number:** WDID No. 5A32CR00090

**Type of Project:** Stabilize eroding banks and streambed, and to restore fish passage along Greenhorn Creek in American Valley.

**Project Location:** Section 7,8,16,17&21, Township 24 North, Range 10 East, MDB&M.  
Latitude: 39°57'00" and Longitude: -120°52'58.8"

**County:** Plumas County

**Receiving Water(s) (hydrologic unit):** Greenhorn Creek, which is tributary to Feather River.  
Feather River Hydrologic Unit-Quincy Hydrologic Area No. 518.52

**Water Body Type:** Riparian, Streambed

**Designated Beneficial Uses:** The Water Quality Control Plan *for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009, has designated beneficial uses for surface and ground waters within the region. Beneficial uses that could be impacted by the project include: Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Cold Freshwater Habitat (COLD); Cold Freshwater Spawning (SPWN); and Wildlife Habitat (WILD).

**Project Description (purpose/goal):** The purpose of the Integrated Greenhorn Creek Restoration Project is to stabilize eroding banks and streambed, and restore fish passage along Greenhorn Creek in American Valley. The two fish passage structures, at the Shea Dam and Reid Dam at Highway 70 will protect the dam from further erosion damage, and stabilize the channel bed and banks using a riffle-pool rock structure with a 4% slope. The bank stabilization treatments (boulder vanes) are designed to maintain the channel within the existing incisement. Boulder vanes are comprised of a line of boulders that maintain a pool, and direct flow vectors toward the center of the channel and away from the banks. Project construction equipment include an excavator and dump trucks, which will access the project on existing travel routes.

**Preliminary Water Quality Concerns:** Construction activities may impact surface waters with increased turbidity and settleable matter.

**Proposed Mitigation to Address Concerns:** Plumas Corporation - Feather River CRM will implement Best Management Practices (BMPs) to control sedimentation and erosion. All temporary affected areas will be restored to pre-construction contours and conditions upon



completion of construction activities. Plumas Corporation - Feather River CRM will conduct turbidity and settleable matter testing during in-water work, stopping work if Basin Plan criteria are exceeded or are observed.

**Fill/Excavation Area:** Project implementation will permanently impact 1.1 acres of riparian and 0.8 acres of un-vegetated streambed and temporarily impact 0.3 acres of riparian.

**Dredge Volume:** Not Applicable

**Possible Listed Species:** Not Applicable

**U.S. Army Corps of Engineers Permit Number:** Nationwide Permit #27

**California Department of Fish and Game Lake and Streambed Alteration Agreement:** Plumas Corporation - Feather River CRM applied for a Streambed Alteration Agreement on 11 June 2011.

**Status of CEQA Compliance:** The Plumas County Planning Department approved the Negative Declaration for this project on 14 July 2011.

**Compensatory Mitigation:** Not Applicable

**Application Fee Provided:** On 13 June 2011 a certification application fee of \$640.00 was submitted as required by 23 CCR §3833b(3)(A) and by 23 CCR §2200(e).



DEPARTMENT OF FISH AND GAME

Charlton H. Bonham, Director



North Central Region  
1701 Nimbus Road, Suite A  
Rancho Cordova, CA 95670-4599  
916-358-2900  
[www.dfg.ca.gov](http://www.dfg.ca.gov)

October 11, 2011

Feather River Coordinated Resource Management  
Leslie Mink  
P.O. Box 3880  
550 Crescent St  
Quincy, CA 95971

Subject: Final Lake or Streambed Alteration Agreement  
Notification No. 1600-2011-0118 -R2  
INTEGRATED GREENHORN CREEK RESTORATION PROJECT

Dear Ms. Mink:

Enclosed is the final Streambed Alteration Agreement (Agreement) for the INTEGRATED GREENHORN CREEK RESTORATION PROJECT (Project). Before the Department of Fish and Game (Department) may issue an Agreement, it must comply with the California Environmental Quality Act (CEQA). In this case, the Department, acting as a responsible agency, filed a notice of determination (NOD) on the same date it signed the Agreement. The NOD was based on information contained in the Mitigated Negative Declaration the lead agency prepared for the Project.

Under CEQA, filing a NOD starts a 30-day period within which a party may challenge the filing agency's approval of the project. You may begin your project before the 30-day period expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

Please be aware that should you, at a later date, request the amendment of this Agreement to include the work proposed at Treatment Unit #1, the Department must fully comply with CEQA prior to granting approval for the proposed change.

If you have any questions regarding this matter, please contact Julie Newman, Staff Environmental Scientist at (530) 283-6866 or [jnewman@dfg.ca.gov](mailto:jnewman@dfg.ca.gov).

Sincerely,

Kent Smith  
Regional Manager

ec: Julie Newman, Staff Environmental Scientist  
Amber Rossi, Fisheries Biologist

[jnewman@dfg.ca.gov](mailto:jnewman@dfg.ca.gov)  
[arossi@dfg.ca.gov](mailto:arossi@dfg.ca.gov)

**CALIFORNIA DEPARTMENT OF FISH AND GAME**  
NORTH CENTRAL REGION  
1701 NIMBUS ROAD, SUITE A  
RANCHO CORDOVA, CA 95670



**STREAMBED ALTERATION AGREEMENT**  
NOTIFICATION NO. 1600-2011-0118-R2  
GREENHORN CREEK

FEATHER RIVER COORDINATED RESOURCE MANAGEMENT  
INTEGRATED GREENHORN CREEK RESTORATION PROJECT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and Feather River Coordinated Resource Management (Permittee) as represented by Leslie Mink.

## **RECITALS**

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified DFG on June 13, 2011 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, DFG has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement.

## **PROJECT LOCATION**

The project is located at Greenhorn Creek in the County of Plumas State of California; Sections 7, 8, 16, 17 and 21 Township 24N, Range 10E U.S. Geological Survey (USGS) maps Quincy and Spring Garden.

## **PROJECT DESCRIPTION**

The project is limited to five treatment units: two fish passage structures and three boulder vane treatments. Total project area is approximately 21 acres within a 400-acre meadow system. The project shall be installed according to the specifications described in the Notification and follow-up email of October 4, 2011, and (for Treatment Areas #2 and #5) subsequent final plans submitted to the Department for approval.

**Treatment Unit #2:** At Shea Dam, 3,000 cubic yards of 4-inch minimum pit run material shall be used to create a 300' long, fish passable riffle-pool structure. Bank

stabilization shall include rock, vegetation and/or a slope of no less than 1:1. Construction access shall be from Quincy Junction Road onto existing ranch road. **Treatment Unit #3:** Boulder vanes shall be installed along a 540-foot section of channel at the Carol Lane East Bridge to stabilize the channel and bank. Access shall be on an existing road. **Treatment Unit #4:** At the Reid/Plumas National Forest bank, boulder vanes shall be installed, banks sloped no less than 1:1 and vegetated along a 390-foot section of actively eroding bank. Access shall be from existing paved road and dirt ranch road. **Treatment Unit #5:** At the Highway 70 irrigation dam (Reid Dam), 4,000 cubic yards of material shall be used to install a 333-foot long fish-passable riffle pool structure. Banks shall be sloped and vegetated. Access shall be from the highway along an existing dirt ranch road. **Treatment Unit #6:** On the Farnsworth property, boulder vanes shall be installed along a 220-foot section of actively eroding bank. Banks shall be sloped and vegetated. Access shall be along an existing dirt ranch road. The following project may be added to this Agreement at a later date by request of the Permittee: **Treatment Unit #1:** Boulder vanes shall be installed for bank stabilization on 1,800 feet of actively eroding banks above and below Quincy Junction Road. Banks shall be re-contoured to a slope of no less than 1:1 and vegetated.

## PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: Pacific pond turtle, bank swallow, yellow warbler, sandhill crane, willow flycatcher, and various life stages of fish, other forms of vertebrate and invetebtrate life and riparian plant species associated with Sierran montane riparian ecosystems.

The adverse effects the project could have on the fish or wildlife resources identified above include: increased sedimentation from adjacent construction, changes to channel profile, colonization by exotic plant species, disruption to nesting birds and other wildlife from project activity, and effects due to dewatering and rewatering from the diversion of water around construction site.

## MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

### 1. Administrative Measures

Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to DFG personnel, or personnel from another state, federal, or local agency upon request.
- 1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of

Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.

- 1.3 Notification of Conflicting Provisions. Permittee shall notify DFG if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, DFG shall contact Permittee to resolve any conflict.
- 1.4 Project Site Entry. Permittee agrees that DFG personnel may enter the project site at any time to verify compliance with the Agreement.

## **2. Avoidance and Minimization Measures**

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

- 2.1 Construction Plans for Treatment Areas #2 and #5. At least 60 days prior to construction, the Permittee shall submit to the California Department of Fish and Game for approval, construction plans for fish passage structures and associated work such as bank protection, that includes construction materials, methods and specifications in both cross section and plan view. The design should include water depth and velocity calculations for fish passage at various water levels. The construction plans shall include a site-specific dewatering plan for each Treatment Unit, including maps or aerial photographs of sufficient scale and resolution to afford meaningful interpretation shall be included as part of the plan. The dewatering plan shall include estimates of instream flow to be diverted, and the method and location of water diversion. The construction plans shall also include a description of ongoing maintenance activities prescribed to keep the fish passage structure in good working condition.
- 2.2 Work Period. Work within Greenhorn Creek shall be confined to the period starting June 1 to October 31, in the year(s) of 2011 to 2015.
- 2.3 Work Period Modification. If Permittee needs more time to complete the project activity, the work may be permitted outside of the work period and extended on a day-to-day basis by the Department representative who reviewed the project, or if unavailable, through contact with the Regional office at regional office contact information. Permittee shall submit a written request for a work period variance to the Department. The work period variance request shall: 1) describe the extent of work already completed; 2) detail the activities that remain to be completed; 3) detail the time required to complete each of the remaining activities; and 4) provide photographs of both the current work completed and the proposed site for continued work. The work period variance request should consider the effects of increased stream flows, rain delays, increased erosion control measures, limited access due to saturated soil conditions, and limited growth of erosion control

grasses due to cool weather. Work period variances are issued at the discretion of the Department. The Department will review the written request to work outside of the established work period. The Department reserves the right to require additional measures to protect fish and wildlife resources as a condition for granting the variance. The Department will have ten (10) calendar days to review the proposed work period variance.

- 2.4 Work Period in Dry Weather Only. Work within Greenhorn Creek shall be restricted to periods of low stream flow and dry weather. Precipitation forecasts and potential increases in stream flow shall be considered when planning construction activities. Construction activities shall cease and all necessary erosion control measures shall be implemented prior to the onset of precipitation. Construction activities halted due to precipitation may resume when precipitation ceases and the National Weather Service 72-hour weather forecast indicates a 20% or less chance of precipitation, provided no work occurs in the stream bed if water is flowing. If a construction phase may cause the introduction of sediments into the stream: 1) no phase of the project shall be started in May or November of any year, unless all work for that phase and all associated erosion control measures are completed prior to the onset of precipitation; and 2) no phase of the project shall commence unless all equipment and materials are removed from the channel at least 12 hours prior to the onset of precipitation and all associated erosion control measures are in place prior to the onset of precipitation. No work will occur during a dry-out period of 24 hours after the above referenced wet weather.
- 2.5 Nesting Birds. To protect nesting birds, no project activities shall occur from June 1 through August 31 unless nesting bird surveys are completed by a qualified biologist, and no nesting birds are present within a 200' radius (500' for threatened and endangered species, and all raptors, including both diurnal and nocturnal species). This Agreement does not allow the Permittee, any employees, or agents to destroy or disturb any active bird nest (Fish and Game Code §3503) or any raptor nest (§3503.5) at any time of the year. This condition does not allow for the take or disturbance of any State or federally listed species, or State listed species of special concern.
- 2.6 Mitigation Measures. The Permittee shall follow all mitigation measures outlined in the Mitigated Negative Declaration and Initial Study for the Integrated Greenhorn Creek Restoration Project (see Exhibit A)
- 2.7 Maintain Aquatic Life. When any dam or other artificial obstruction is being constructed, maintained, or placed in operation, Permittee shall allow sufficient water at all times to pass downstream to maintain aquatic life below the dam pursuant to Fish and Game Code §5937.

- 2.8 Stranded Aquatic Life. The Permittee shall check daily for stranded aquatic life as the water level in the dewatering area drops. All reasonable efforts shall be made to capture and move all stranded aquatic life observed in the dewatered areas. Capture methods may include fish landing nets, dip nets, buckets and by hand. Captured aquatic life shall be released immediately in the closest body of water adjacent to the work site. This condition does not allow for the take or disturbance of any State or federally listed species, or State listed species of special concern.
- 2.9 Minimize Turbidity and Siltation. Permittee shall take precautions to minimize turbidity/siltation during construction and post-construction periods. Precautions shall include, but are not limited to: pre-construction planning to identify site specific turbidity and siltation minimization measures and best management erosion control practices; best management erosion control practices during project activity; and settling, filtering, or otherwise treating silty and turbid water prior to discharge into a stream.
- 2.10 Rock Where Vegetation Cannot Re-establish. Permittee shall place rock, riprap, or other erosion protection in areas where vegetation cannot reasonably be expected to become re established. All other areas of disturbed soil which drains toward the stream channel shall be seeded with native plant seed or planted with native plants.
- 2.11 Pollution Control. Utilize best management practices to prevent spills and leaks into water bodies. If maintenance or refueling of vehicles or equipment must occur on-site, use a designated area and/or a secondary containment, located away from drainage courses to prevent the runoff of storm water and the runoff of spills. Prior to daily use, ensure that all vehicles and equipment are in good working order (no leaks). Ensure that all construction areas have proper spill clean up materials (absorbent pads, sealed containers, booms, etc.) to contain the movement of any spilled substances. Any other substances which could be hazardous to aquatic life (e.g. debris, soil, sand, bark, slash, sawdust, rubbish, cement/concrete or washings thereof, asphalt, paint or other coating material, oil or petroleum products), resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake by the Applicant or any party working under contract or with the permission of the Permittee, shall be removed immediately. DFG shall be notified immediately by the Permittee of any spills and shall be consulted regarding clean up procedures. No rubbish shall be deposited within 150 feet from the high water mark of any watercourse or lake.
- 2.12 Temporary Channel Construction. Permittee shall divert the entire flow of the stream around the construction site via a temporary channel. The temporary channel shall be constructed in the following manner:

- C. Begin excavation for the temporary channel at the downstream end of the diversion, but leave a 3 - 5 foot "plug" between the flowing stream and the beginning of the excavation.
- D. Build the temporary channel with new banks at approximately a 4 to 1 side-slope to avoid collapse. Excavate the diversion channel upstream to approximately 3 - 5 feet from the flowing stream leaving a "plug" of gravel to isolate the excavated temporary channel from the flowing stream.
- E. Allow the water within the isolated excavation area to clear overnight, or divert to a settling and filtration zone prior to channel reentry.
- F. Breach the "plugs" – downstream end first, to allow the stream to enter the temporary channel. This should be done by hand or with small equipment to cause the least disturbance.
- G. Place a clean diversion barrier (such as clean gravel or bladder dam) across the stream on an angle to divert flow into the new channel.
- H. Upon project completion, notch the gravel barrier down to water level and allow heavy winter flows to wash out the remaining gravel barrier.

### **3. Reporting Measures**

Permittee shall meet each reporting requirement described below.

- 3.1. The Permittee shall notify DFG within two working days of beginning work within the stream zone. Notification shall be submitted as instructed in Contact Information section below. Email notification is preferred.
- 3.2. Upon completion of the project activities described in this agreement, the work area within the stream zone shall be digitally photographed. Photographs shall be submitted to DFG within two weeks of completion. Email notification is preferred
- 3.3. Monitoring Report – Success Criteria. Permittee shall submit an annual monitoring report to the Department by December 31 of each year after completion of the first Treatment Unit, and for three years after completion of the last Treatment Unit. Each treatment unit shall be monitored and reported on annually for three years. The annual monitoring report shall provide a status report on all Treatment Units completed to date and plans for constructing the remainder of the Treatment Units. The report shall discuss project performance as it relates to success criteria. The report shall include the results of natural revegetation establishment, bank stabilization efforts and fish passage improvement.



## **CONTACT INFORMATION**

Any communication that Permittee or DFG submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or DFG specifies by written notice to the other.

### To Permittee:

Feather River Coordinated Resource Management  
Attn: Leslie Mink  
P.O. Box 3880  
550 Crescent St  
Quincy, CA 95971  
FAX: (530) 283-5465  
leslie@plumascounty.org

### To DFG:

Department of Fish and Game  
North Central Region  
1701 Nimbus Road  
Attn: Lake and Streambed Alteration Program – Julie Newman  
Notification #1600-2011-0118-R2  
Fax (530) 358-2912  
jnewman@dfg.ca.gov

## **LIABILITY**

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute DFG's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

## **SUSPENSION AND REVOCATION**

DFG may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees,

representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before DFG suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before DFG suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused DFG to issue the notice.

## **ENFORCEMENT**

Nothing in the Agreement precludes DFG from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects DFG's enforcement authority or that of its enforcement personnel.

## **OTHER LEGAL OBLIGATIONS**

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 et seq. (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

## **AMENDMENT**

DFG may amend the Agreement at any time during its term if DFG determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by DFG and Permittee. To request an amendment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

## **TRANSFER AND ASSIGNMENT**

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter DFG approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

## **EXTENSIONS**

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to DFG a completed DFG "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). DFG shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (Fish & G. Code, § 1605, subd. (f)). .

## **EFFECTIVE DATE**

The Agreement becomes effective on the date of DFG's signature, which shall be: 1) after Permittee's signature; 2) after DFG complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at [http://www.dfg.ca.gov/habcon/ceqa/ceqa\\_changes.html](http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html).

## **TERM**

This Agreement shall expire five years from the day it has been signed by both parties unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

## EXHIBITS

The documents listed below are included as exhibits to the Agreement and incorporated herein by reference.

- A. Exhibit A. Initial Study and Mitigated Negative Declaration for Integrated Greenhorn Creek Restoration Project

## AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

## AUTHORIZATION

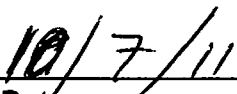
This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify DFG in accordance with Fish and Game Code §1602.

## CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.


### FOR FEATHER RIVER COORDINATED RESOURCE MANAGEMENT

  
\_\_\_\_\_  
Leslie Mink  
Project Manager

  
\_\_\_\_\_  
Date

### FOR DEPARTMENT OF FISH AND GAME

  
\_\_\_\_\_  
Kent Smith  
Regional Manager

  
\_\_\_\_\_  
Date

Prepared by: Julie Newman  
Staff Environmental Scientist

## Appendix B3

### CEQA/NEPA Compliance Form

(California Environmental Quality Act & National Environmental Policy Act)

#### CEQA STATUS

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☐ **“Not a Project” per CEQA**

1. Describe how your project is “Not a Project” per CEQA:

2. If appropriate, provide documentation to support the “Not a Project” per CEQA status.

☐ **Categorical Exemption or Statutory Exemption**

If a project is categorically exempt from CEQA, all applicants, including public agencies that provide a filed Notice of Exemption, are required to provide a clear and comprehensive description of the physical attributes of the project site, including potential and known special-status species and habitat, in order for the SNC to make a determination that the project is exempt. A particular project that ordinarily would fall under a specific category of exemption may require further CEQA review due to individual circumstances, i.e., it is within a sensitive location, has a cumulative impact, has a significant effect on the environment, is within a scenic highway, impacts an historical resource, or is on a hazardous waste site. Potential cultural/archaeological resources must be noted, but do not need to be specifically listed or mapped at the time of application submittal. Backup data informing the exemption decision, such as biological surveys, Cultural Information Center requests, research papers, etc. should accompany the full application. Applicants anticipating the SNC to file an exemption are encouraged to conduct the appropriate surveys and submit an information request to an office of the California Historical Resources Information System (CHRIS).

1. Describe how your project complies with the requirements for claiming a Categorical or Statutory Exemption per CEQA:

2. If your organization is a state or local governmental agency, submit a signed, approved Notice of Exemption (NOE) documenting the use of the Categorical Exemption or Statutory Exemption, along with any permits, surveys, and/or reports that have been completed to support this CEQA status. The Notice of Exemption must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.

3. If your organization is a nonprofit or federal agency, there is no other California public agency having discretionary authority over your project, and you would like the SNC to prepare a NOE for your project, let us know that and provide any permits, surveys, and/or reports that have been completed to support the CEQA status.

- 
- ☐ **Negative Declaration OR**  
☒ **Mitigated Negative Declaration**

If a project requires a Negative Declaration or Mitigated Negative Declaration, then applicants must work with a qualified public agency, i.e., one that has discretionary authority over project approval or permitting, to complete the CEQA process.

1. Describe how your project complies with the requirements for the use of a Negative Declaration or a Mitigated Negative Declaration per CEQA:

The Notice of Determination approved the project as a Mitigated Negative Declaration because there were no significant impacts that could not be mitigated.

2. Submit the approved Initial Study and Negative Declaration/Mitigated Negative Declaration along with any Mitigation Monitoring or Reporting Plans, permits, surveys, and/or reports that have been completed to support this CEQA status. The IS/ND/MND must be accompanied by a signed, approved Notice of Determination, which must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.

See attached IS for the MND and the Notice of Determination.

---

☐ **Environmental Impact Report**

If a project requires an Environmental Impact Report, then applicants must work with a qualified public agency, i.e., one that has discretionary authority over project approval or permitting, to complete the CEQA process.

1. Describe how your project complies with the requirements for the use of an Environmental Impact Report per CEQA:

2. Submit the Draft and Final Environmental Impact Report along with any Mitigation Monitoring or Reporting Plans, permits, surveys, and/or reports that have been completed to support this CEQA status. The EIR documentation must be accompanied by a signed, approved Notice of Determination, which must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.

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### **NEPA STATUS**

**(Applicable to federal applicants, some tribal organizations, and applicants receiving federal funding or conducting activities on federal lands)**

Check the box that corresponds with the NEPA compliance for your project.

☐ **Categorical Exclusion**

1. Describe how your project complies with the requirements for claiming a Categorical Exclusion per NEPA:

2. Submit the signed, approved Decision Memo and Categorical Exclusion, as well as documentation to support the Categorical Exclusion, including any permits, surveys, and/or reports that have been completed to support this NEPA status:

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☒ **Environmental Assessment & Finding of No Significant Impact**

1. Describe how your project complies with the requirements for the use of an Environmental Assessment and Finding of No Significant Impact per NEPA:

All of the ten FONSI points were met as required for an EA. This was required only for the Reid/PNF bank that was constructed in October 2011 because the project was located partially on National Forest land. The Army Corps of Engineer 404 permit for the entire project area also must comply with NEPA, which is accomplished through the Clean Water Act Section 404 permit process (attached).

2. Submit the signed, approved Environmental Assessment and Finding of No Significant Impact along with any permits, surveys, and/or reports that have been completed to support this NEPA status.

See attached. Please note that the Plumas National Forest EA only covers the decision to construct Reid/PNF bank, which was completed in October 2011. It is included here because this bank is part of the entire Greenhorn Creek Integrated Restoration Project, and is used as match for this grant request to SNC.

I have also attached our application to the Army Corps of Engineers for coverage under Nationwide Permit 27, which serves as the "report" that supports the Section 404 Army Corps permit under NEPA.

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☐ **Environmental Impact Statement**

1. Describe how your project complies with the requirements for the use of an Environmental Impact Statement per NEPA:



## **Initial Study Integrated Greenhorn Creek Restoration Project**

**Date of Initial Study Preparation:** May 2011

**Lead Agency Name and Address:** Plumas County Planning Department 555 Main Street Quincy,  
CA 95971 530-283-7006

**Prepared By:** Leslie Mink, Plumas Corporation PO Box 3880 Quincy, CA 95971  
530-283-3739

**Project location:** American Valley in Plumas County, T.24N, R.10E, Sections 7, 8, 16, 17, and 21

**Applicant/Owner:** Plumas Corporation is the applicant. Properties are owned by Robert and Dorothy Farnworth, Arthur and Margaret Scoppwer, Johanne Daniels, Russell and Elizabeth Reid, Lois Jones, Chandler Hills Country Club, Victoria Shea, Allan Hansen, Lane and Lisa Labbe, and the United States Forest Service.

**General Plan designation:** Floodplain, Special Plan-Scenic Area, Special Plan-Scenic Road, Secondary Suburban

**Zoning:** AP (Agricultural Preserve), GA (General Agriculture), S-3 (Secondary Suburban), FP (Floodplain), Sp-ScA (Special Plan-Scenic Area), SP-ScR (Special Plan-Scenic Road), MH (Mobile Home Combining Zone)

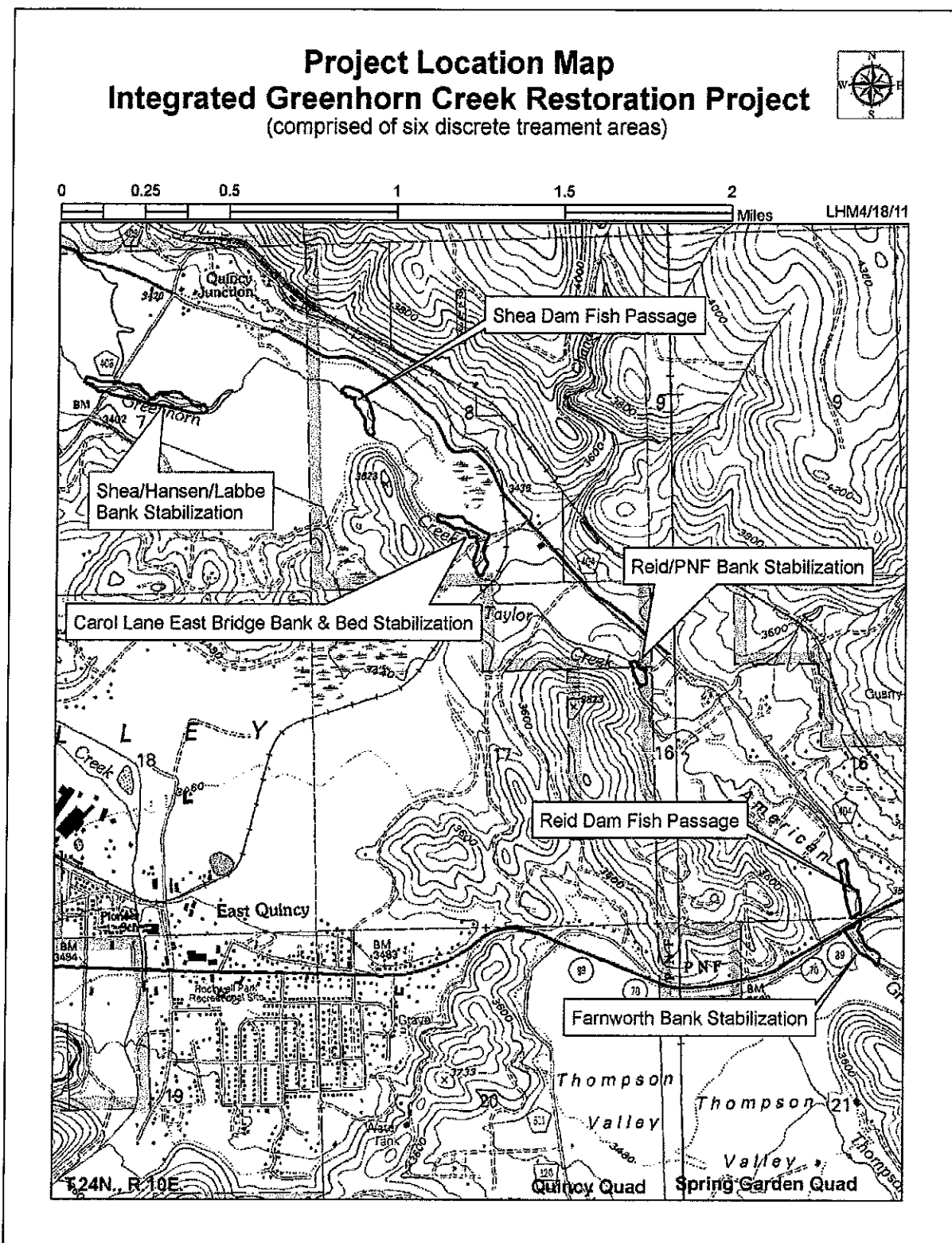


Figure 1. Project Location.

## Project Description

The Integrated Greenhorn Creek Restoration Project is comprised of six discrete treatment units, totaling approximately 21 acres, within a 400-acre meadow system. Implementation at any one of the treatment sites is not dependent upon implementation at any other site. Neither short nor long term effects of implementation are expected to occur outside of any treatment unit boundary. However, all treatments are being analyzed under one CEQA Initial Study as an integrated restoration approach across multiple jurisdictional boundaries.

Greenhorn Creek is the primary water course through American Valley, and has been an important resource for both Euro-American settlers and Native Americans before them. Through recent history, existing uses have taken a toll on the ability of the system to ecologically absorb perturbations. Bob Farnworth recalls the construction of the Highway 70 bridge in 1941 that involved moving the confluence of Thompson Creek with Greenhorn Creek, and the 1955 flood when channel down-cutting began in earnest. The proposed treatments consider existing land uses, constraints, and channel dynamics, including bedload movement through the Greenhorn Creek system. The two fish passage structures, at the Shea Dam and Reid Dam at Highway 70 (treatments 2 and 5 listed below) would protect the dams from further erosion damage, and stabilize the channel bed and banks using a riffle-pool rock structure with a 4% slope (see Figures 7 & 12). The bank stabilization treatments maintain the channel within the existing incisement using boulder vanes. Boulder vanes are comprised of a line of boulders that maintains a pool, and directs flow vectors toward the center of the channel and away from the banks (see plan view maps and cross-sections below). Project construction equipment would include an excavator and dump trucks, which would access the project areas on existing travel routes. A water truck would also be used for dust abatement when necessary. The following lists all Greenhorn Integrated Restoration Project treatments considered under this analysis (see Figures 2-14):

Map 1. Above and below Quincy Junction Road, boulder vanes would be installed on 1,800 feet of actively eroding banks for stabilization. Banks would be re-contoured to a 2:1 slope and vegetated. Access into the APE would be from the Quincy Junction Road onto an existing ranch access route.

Map 2. At the Shea Dam, 3,000 cubic yards of 4'-minus pit material would be used to create a 350'-long, fish passable riffle-pool structure. Bank stabilization using rock, vegetation, and/or 2:1 sloping upstream of the dam. Access into the APE would be from the existing gravel driveway, which was constructed of imported fill.

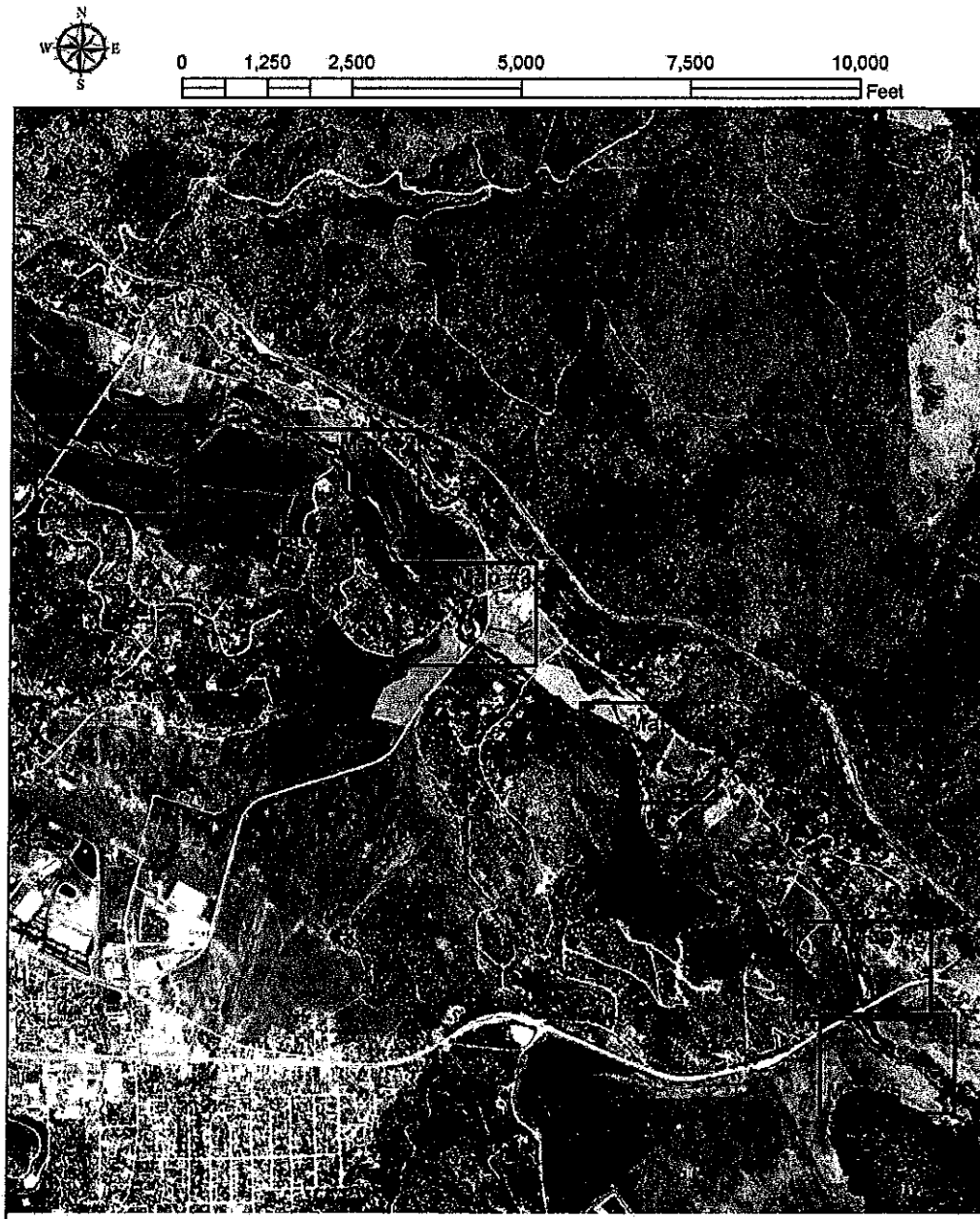
Map 3. At the Carol Lane East Bridge, boulder vanes would be installed along a 540 foot section of channel to stabilize the channel bed and bank. Access into the APE would be on the existing road.

Map 4. At the Reid/PNF (Plumas National Forest) bank, boulder vanes would be installed, and banks sloped (2:1) and vegetated along a 390-foot section of actively eroding bank. Access into the APE from the paved road would be on the existing dirt ranch road.

Map 5. At the Highway 70 irrigation dam (Reid Dam), 4,000 cubic yards of material would be used to install a 333'-long fish-passable riffle pool structure. Banks would be sloped and vegetated. Access from the highway would be on an existing dirt ranch road.

Map 6. On the Farnworth property, boulder vanes would be installed along a 220 foot section of actively eroding bank. Banks would be sloped and vegetated. Access from the highway would be on an existing dirt ranch road.

## Integrated Greenhorn Creek Restoration Project Plan View Map Key



LHM 5/25/11

Figure 2. Plan view detail key map.

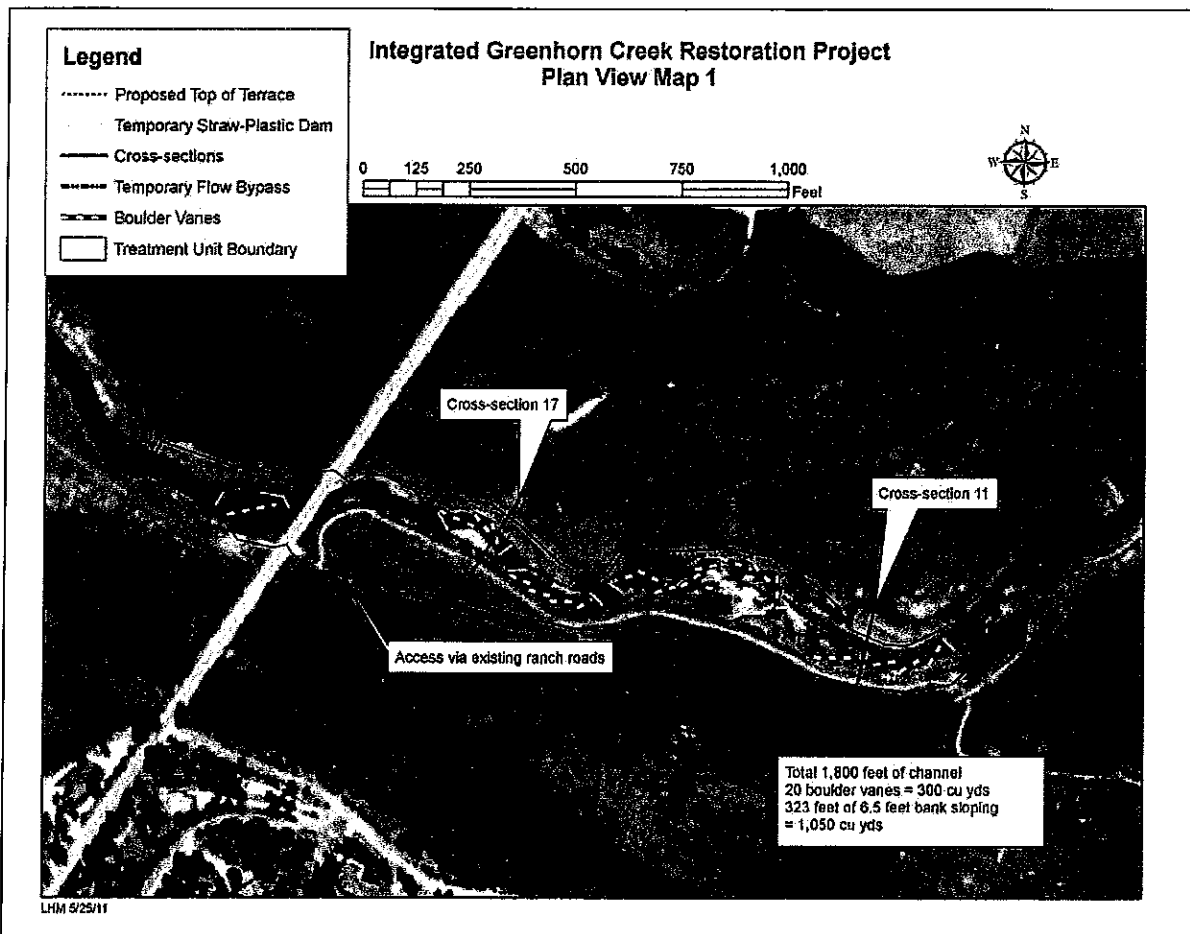


Figure 3. Plan view Map 1 - Above and Below Quincy Junction Road.

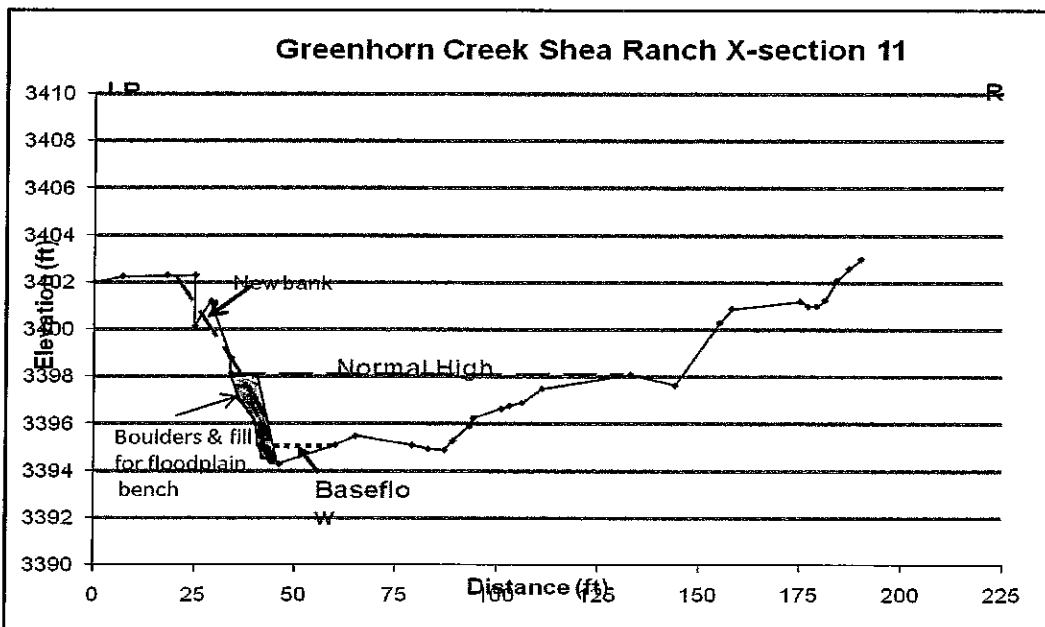


Figure 4. Cross-section 11 above Quincy Junction Road.

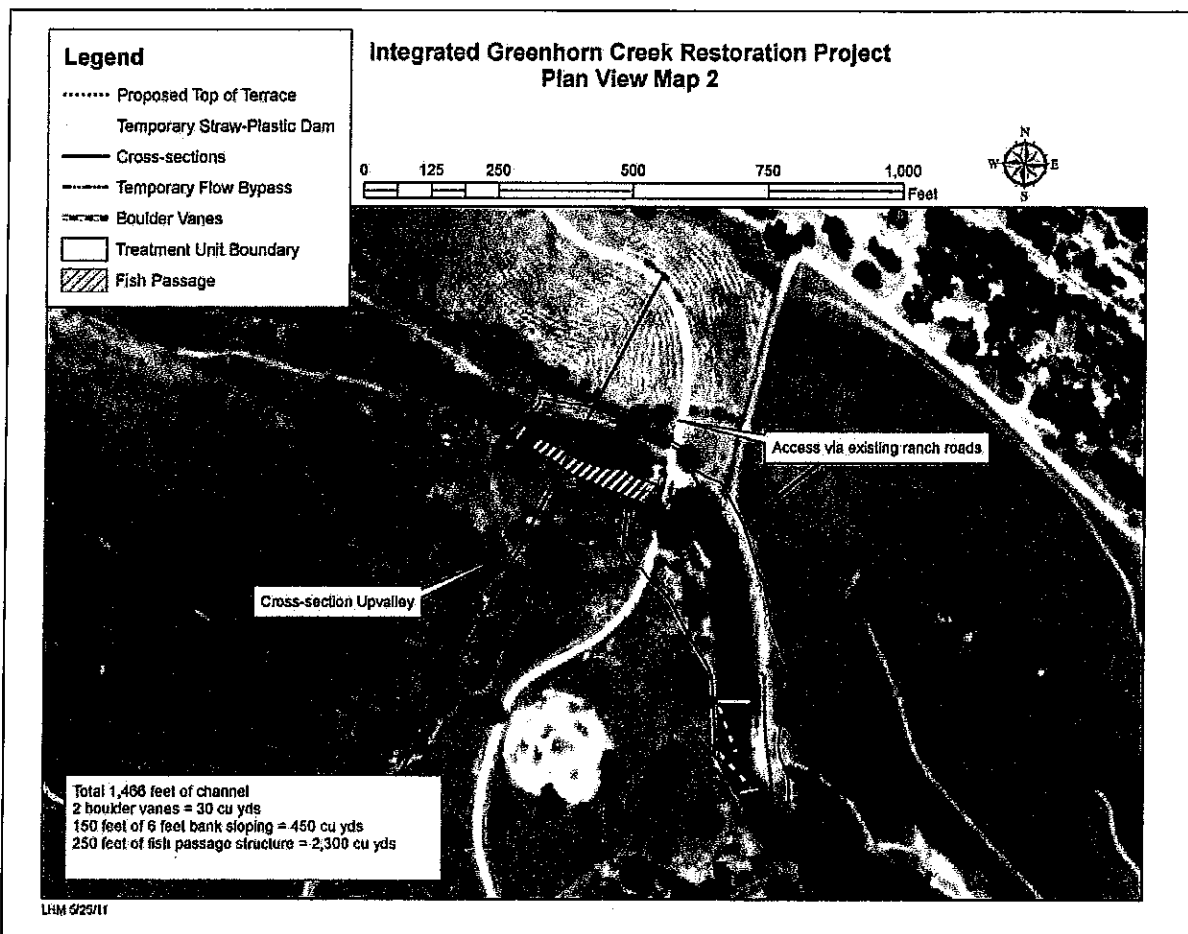


Figure 5. Plan View Map 2, Shea Dam Treatment Site.

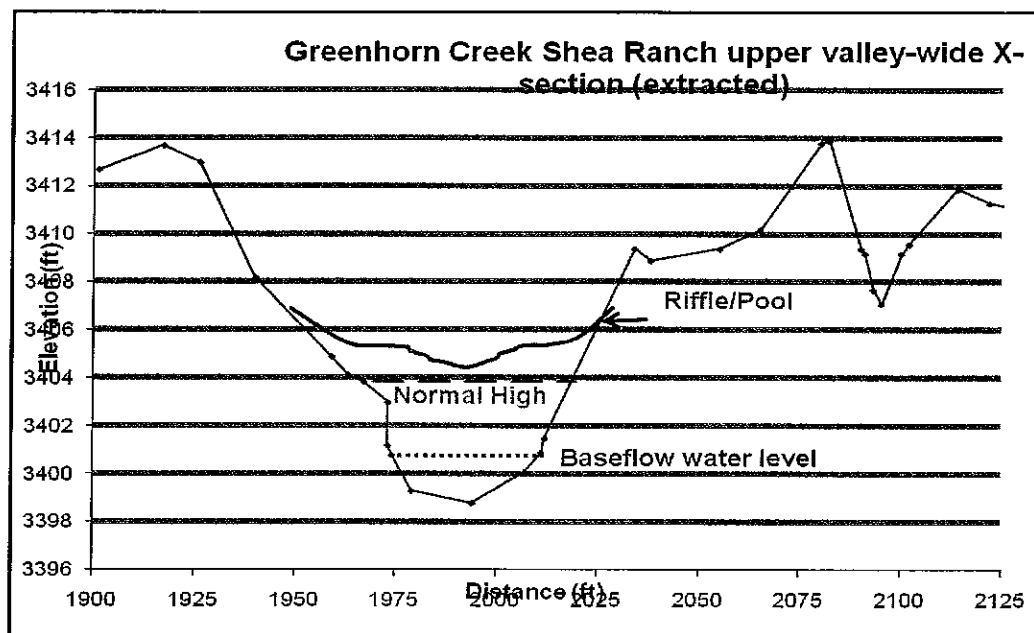


Figure 6. Cross-section of fish passage structure on Map 2.

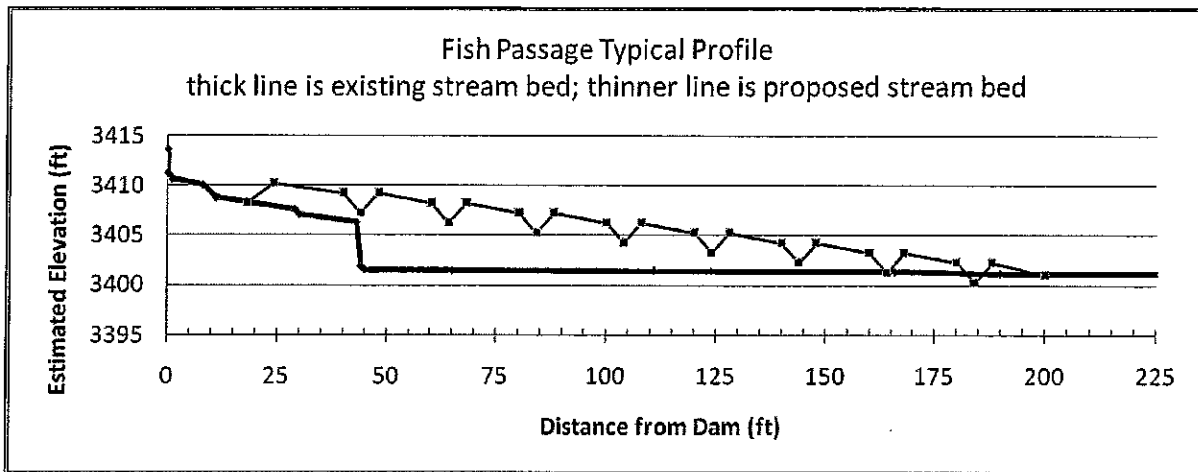


Figure 7. Profile of fish passage structure on Map 2.

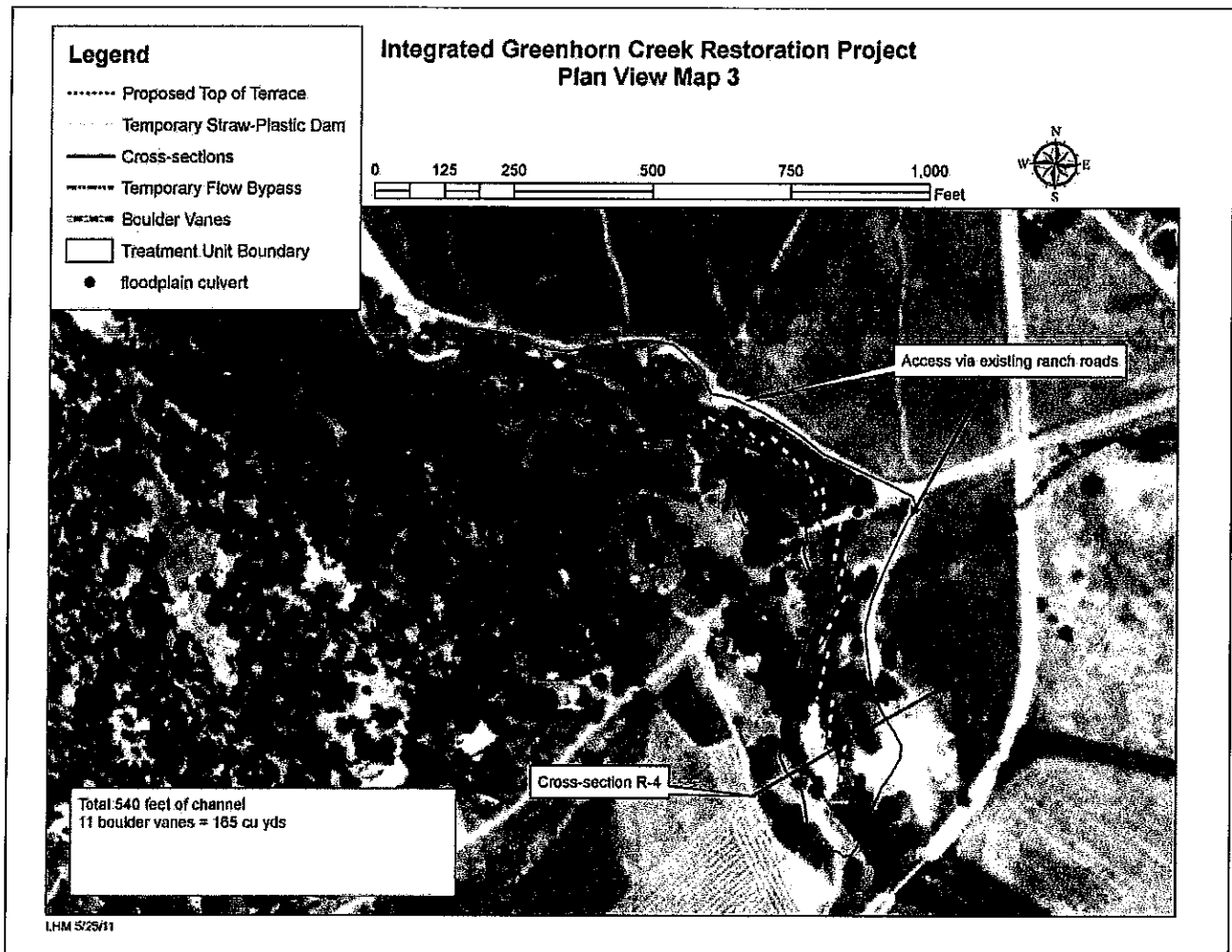
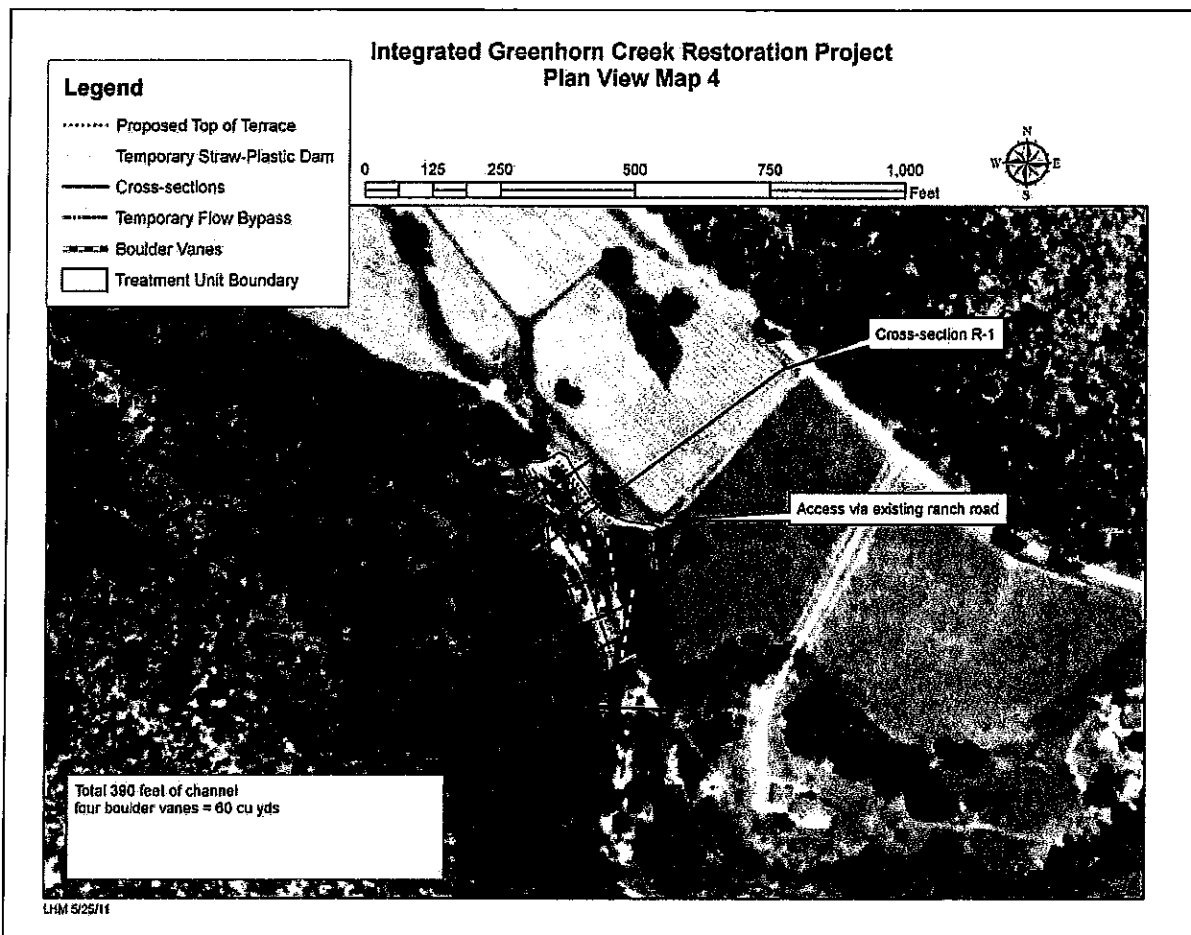
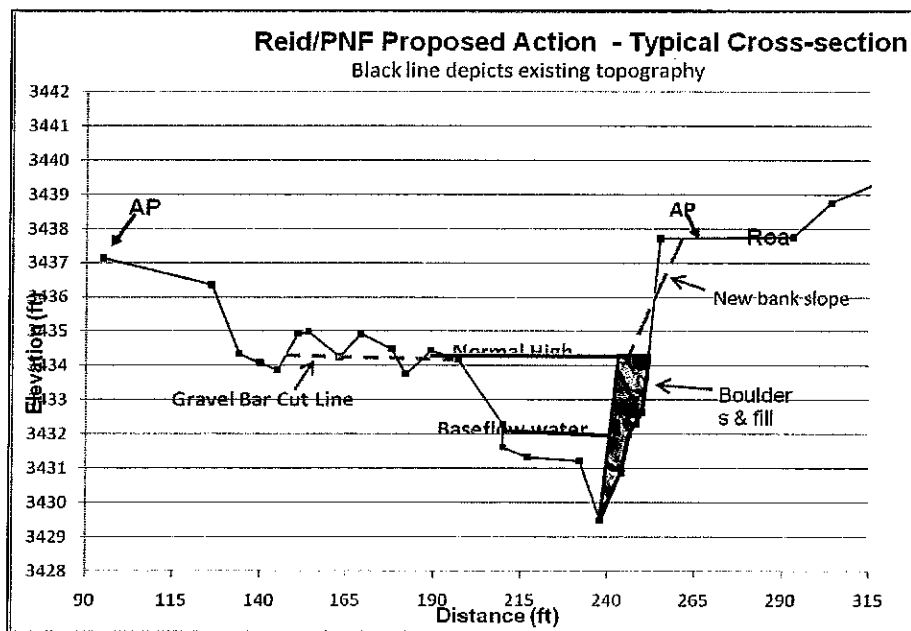


Figure 8. Map 3, Carol Lane East Bridge. No bank sloping.



**Figure 9. Map 4, Reid/PNF Treatment Site.**



**Figure 10. Expanded Cross-section R-1 on Map 4.**



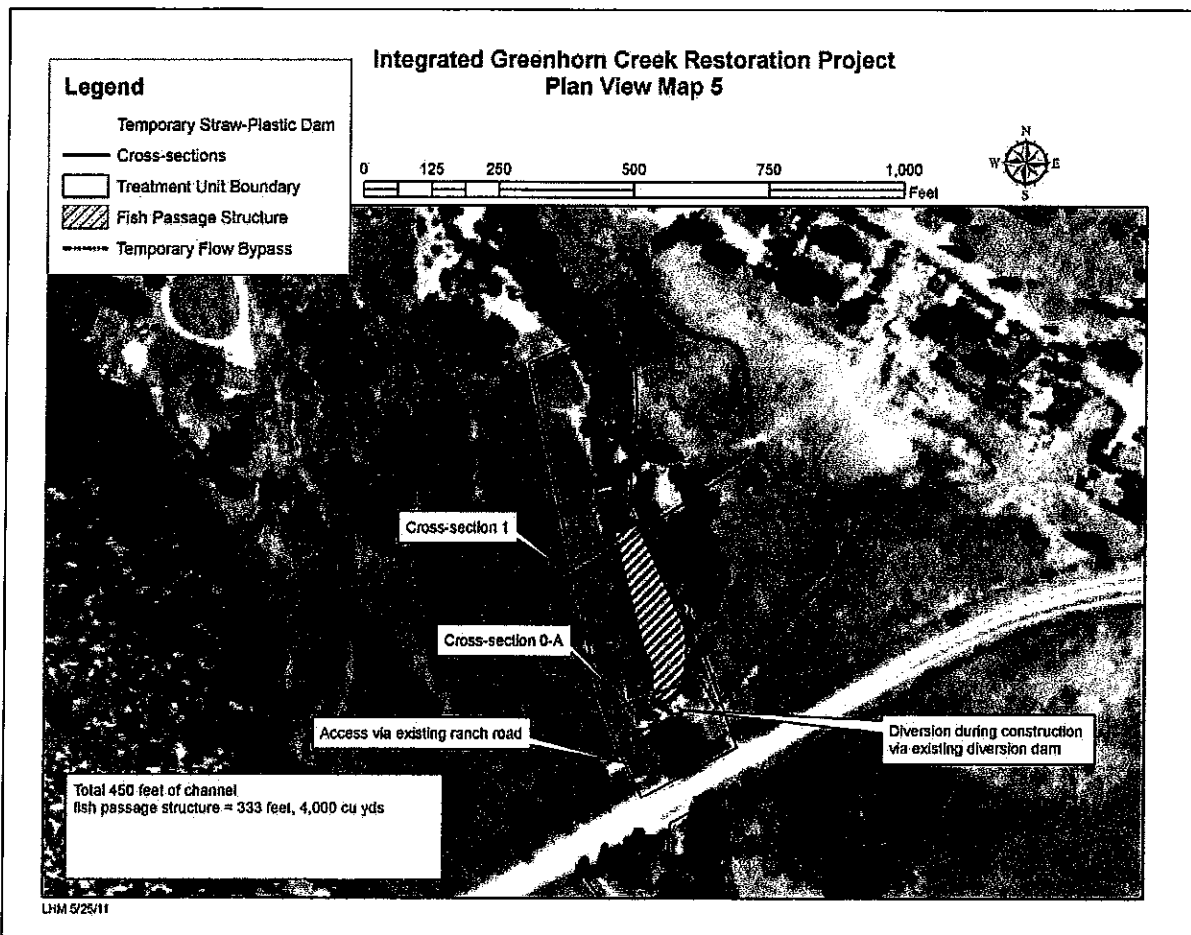


Figure 11. Map 5, Scoppwer Treatment Site, Reid Dam fish passage.

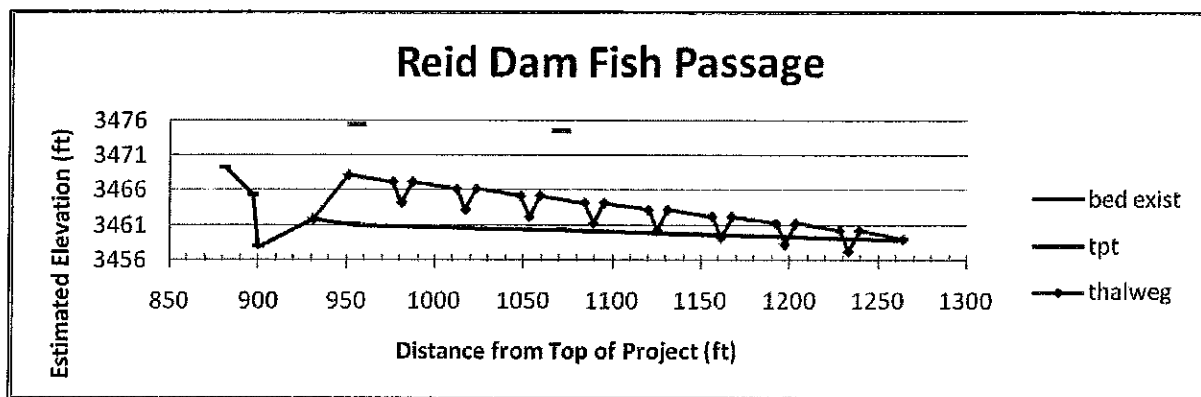


Figure 12. Reid Dam fish passage profile. Tpt refers to the terraced meadow (top of terrace).

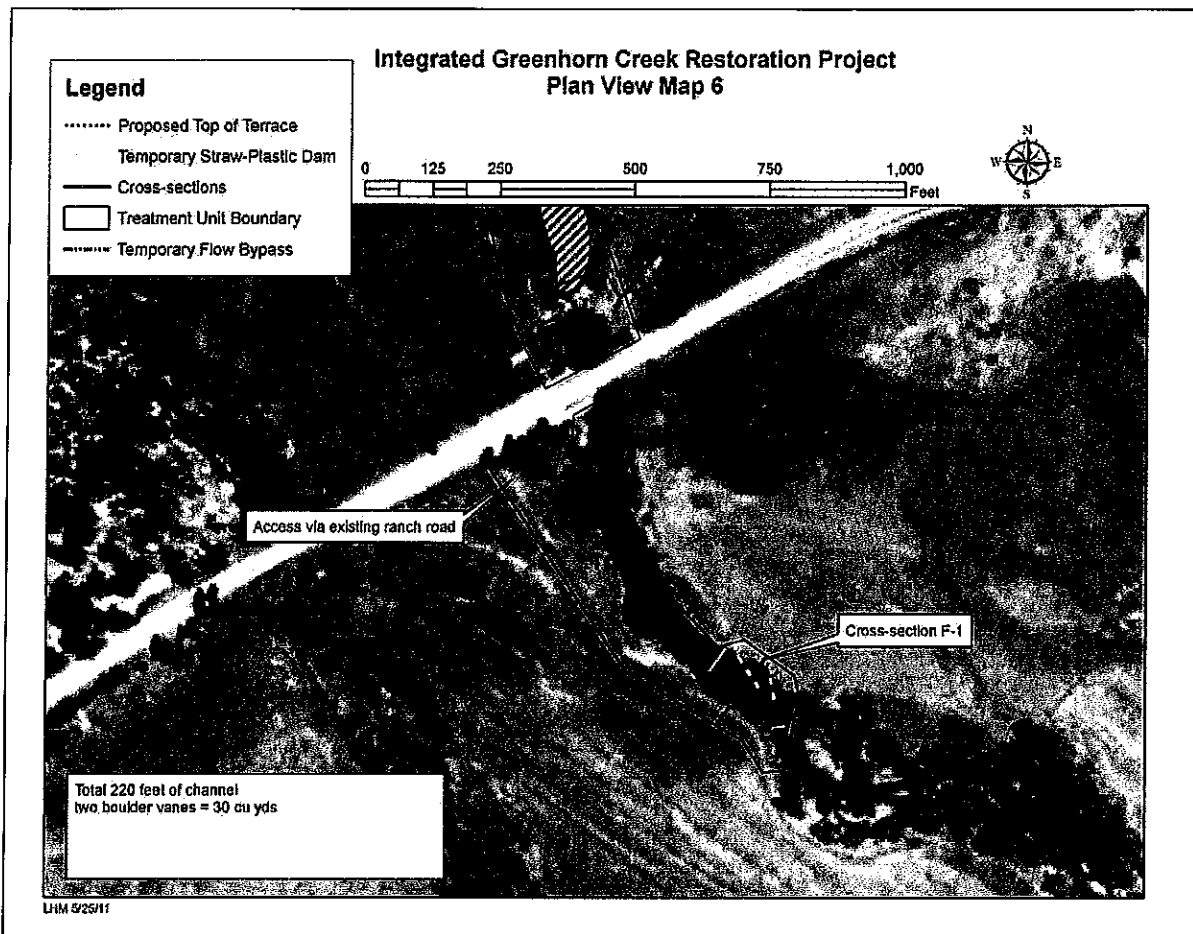


Figure 13. Map 6, Farnworth Treatment Site.

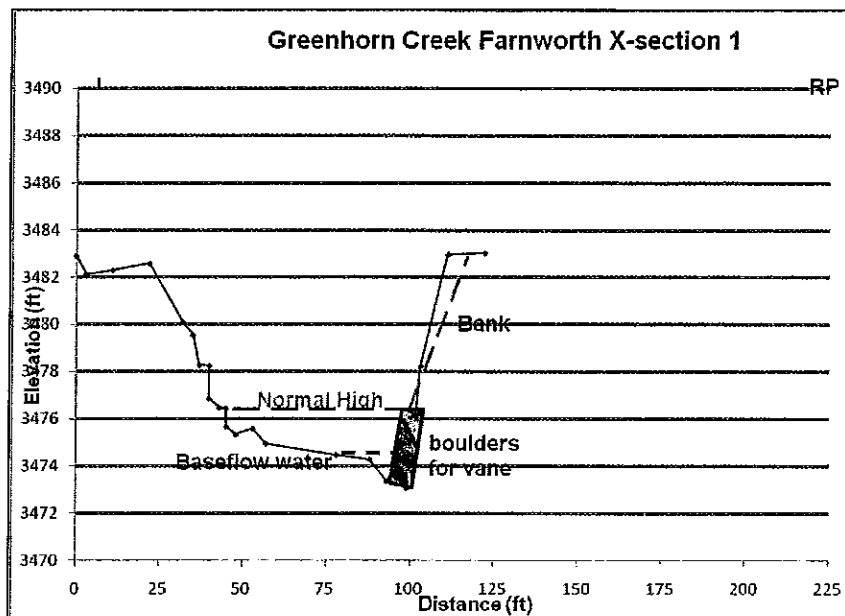


Figure 14. Cross-section of boulder vane for Map 6.

### **Water Diversion Plan**

The purpose of diverting water around the work area is to protect water quality and fish habitat, and to ensure that the water supply to downstream users is not interrupted. The Water Diversion Plan for this project is illustrated in each of the detailed plan view maps above. The maps show the location of boulder vanes and fish passage structures that are part of the project work objectives. The maps also show the locations of temporary straw bale/plastic dams that would be located above and below each work area, as well as the location of a temporary flow bypass channel. The strawbale/plastic dams would be used to isolate the work area, and direct flow into the temporary flow bypass channel. The temporary flow bypass channel would use channel features that currently exist within the treatment areas. In cases where excavation of a channel is necessary, care would be taken to avoid disturbing existing riparian vegetation. Existing vegetation will be used as much as possible to aid in filtration of bypass flows before they re-enter the channel, so that sediment is trapped.

Not shown on the maps are Sedimats® that would be used at the mouth of each bypass channel as an additional precaution to trap any sediment before it can enter the channel. Also not shown is a 1-2 cfs water pump that will be used to keep the work area as dry as possible. Pump effluent will be discharged onto vegetation in a manner that filters out sediment before it re-enters the channel.

Work areas will be constructed one at a time, and work will be completed in each work area before moving to the next area. Completion of work includes re-contouring and re-vegetating the temporary bypass channel. Turbidity samples will be collected once in the middle of each work day above and below each work area to document water quality during construction.

### **Adherence to Plumas County Board of Supervisors Resolution #2011-7685**

This Initial Study document meets the intent of the resolution in the following ways:

- Potentially affected water users (all water rights holders and landowners adjacent to the channel on Greenhorn Creek below and within the project area) have been involved with project planning in the following ways: Letters were sent in March 2007, February 2008, November 2008, January 2009, and April 2009; and two public meetings were held in March 2008 (Quincy library) and December 2008 (on-site in the field) for early involvement in project development and planning. A NEPA scoping letter was sent on February 24, 2011 for the Reid/PNF Treatment Unit only. A CEQA scoping letter (preliminary review memo) was sent on April 22, 2011, and a public meeting was held on May 4, 2011 to receive oral comments. During the CEQA scoping period, two comments were received by email, and six received at the public meeting. The project description and this analysis address comments expressed during the planning process since 2007, including those received during the scoping period.
- Short term and long term potential impacts to water supply and stream flows are addressed in the hydrology portion of this document. In summary, since the project is a bank stabilization project that does not affect the floodplain or the course of the channel, there would be no long term impact to water supply. Since water will be by-passed around the construction areas, there will be no short term impact to water supply during construction. As a stream restoration project with no effect to water supply, there is no need for a water right permit.
- All mitigation measures are enumerated in this document.
- All water rights holders within and downstream of the project area are aware of the project, and have not expressed a concern over water rights. The treatment techniques would not impact water rights or water supply in the short term or long term.

Implementation funding has only been secured for the Reid/PNF Treatment Unit portion of the project. Construction for the Reid/PNF Treatment Unit is scheduled for fall of 2011. Implementation funding has not been secured for the other treatment units, but those treatments are tentatively planned for 2012 implementation. Because the Reid/PNF Treatment Unit also includes National Forest land, a separate Environmental Analysis is being prepared for that portion of the project in conjunction with this Initial

Study which includes all treatment units in the Integrated Greenhorn Creek Restoration Project. The Mt. Hough District Ranger decision for the Reid/PNF Treatment Unit is expected in late spring or early summer 2011.

Bank sloping without boulder vanes was also considered as an alternative to the proposed project description, however, this alternative was rejected because boulder vanes have been proven to be more effective in protecting stream bank stability than just re-shaping alone.

**Environmental Setting and Surrounding Land Uses:** The project area is comprised of six separate treatment units within a 400-acre meadow. The treatment units are primarily located on private land, with one acre of public land within the Reid/PNF Treatment Unit. The primary land use is agricultural grazing and haying, interspersed with low density housing.

**Relationship to Other Projects:** This project is not related to any other project.

**Other public agencies whose approval is required:** California Dept of Fish and Game Streambed Alteration Agreement, Regional Water Quality Control Board Water Quality Certification, US Army Corps of Engineers approval under Nationwide Permit #27. This proposed project complies with all existing laws.

**Environmental Factors Potentially Affected**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" and subject to mitigation as indicated by the checklist on the following pages.

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Aesthetics                      | <input type="checkbox"/> Agriculture/Forestry Resources           | <input checked="" type="checkbox"/> Air Quality               |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources            | <input checked="" type="checkbox"/> Geology/Soils             |
| <input type="checkbox"/> Greenhouse Gas Emissions        | <input checked="" type="checkbox"/> Hazards & Hazardous Materials | <input checked="" type="checkbox"/> Hydrology / Water Quality |
| <input type="checkbox"/> Land Use / Planning             | <input type="checkbox"/> Mineral Resources                        | <input type="checkbox"/> Noise                                |
| <input type="checkbox"/> Population / Housing            | <input type="checkbox"/> Public Services                          | <input type="checkbox"/> Recreation                           |
| <input type="checkbox"/> Transportation/Traffic          | <input type="checkbox"/> Utilities/Service Systems                | <input type="checkbox"/> Mandatory Findings of Significance   |

**DETERMINATION:**

On the basis of this initial evaluation:

- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

 6/2/11  
Jim Graham, Senior Planner Date

## SUMMARY OF RECOMMENDED MITIGATION MEASURES

**1. Air Quality Impacts:** To control dust, the grading activity will be conducted in a manner in compliance with the rules and regulations of the Northern Sierra Air Quality Management District. Appropriate measures for this type of project include the preparation of a dust control plan. The dust control plan shall contain the following minimum requirements:

**Mitigation Measure 3A.** All material excavated, stockpiled, or graded shall be sufficiently watered, treated, or covered to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering may occur at least twice daily, with complete site coverage, if necessary.

**Mitigation Measure 3B.** All areas with vehicle traffic shall be watered or have dust palliative applied as necessary for regular stabilization of dust emissions.

**Mitigation Measure 3C.** All on-site vehicle traffic shall be limited to a speed of 15 mph on unpaved roads.

**Mitigation Measure 3D.** All land clearing, grading, earth moving, or excavation activities on a project shall be suspended as necessary to prevent excessive windblown dust when winds are expected to exceed 20 mph.

**Mitigation Measure 3E.** All inactive portions of the site shall be covered, seeded, or watered until a suitable cover is established. Alternatively, the applicant shall be responsible for applying County-approved non-toxic soil stabilizers (according to manufacturers specifications) to all inactive construction areas (previously graded areas which remain inactive for 96 hours) in accordance with the local grading ordinance.

**Mitigation Measure 3F.** All material transported off-site shall be either sufficiently watered or securely covered to prevent public nuisance, and there must be a minimum of six (6) inches of freeboard in the bed of the transport vehicle.

**Mitigation Measure 3G.** Paved streets adjacent to the project shall be swept or washed at the end of each day, or more frequently if necessary to remove excessive accumulations of silt and/or mud which may have resulted from activities at the project site.

**Mitigation Measure 3H.** The project proponent shall re-establish ground cover on the site through seeding and watering in accordance with the local grading ordinance.

**Plan Requirements:** Equipment contracts shall include the above language and operators instructed in the field prior to beginning work.

**Timing:** All adequate dust control measures shall be implemented in a timely manner during all phases of project development and construction.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to ensure that traffic safety practices are followed. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project.

**2. Biological Impacts:** To minimize potential impacts to biological resources resulting from the proposed project, the following mitigation measures shall be required:

The following mitigation measure is recommended in order to reduce impacts to sensitive plants:

**Mitigation Measure 4A.** Flag and avoid any sensitive plants that may be found during construction. Flag and avoid noxious weed areas, cleaning equipment, using weed free material and mulch, remove plants and/or seed heads prior to construction, and remove noxious weed plants for three years after construction.

**Plan Requirements:** Equipment operators shall be instructed in how to follow flagging.

**Timing:** This measure shall be implemented during all site preparation and construction activities.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to ensure that flagging guidelines are followed. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project.

The following mitigation measure is recommended in order to reduce impacts to Pacific turtles, willow flycatchers, sandhill cranes, and yellow warblers:

**Mitigation Measure 4B.**

4.B.1 Pacific turtles - Re-survey the project area prior to construction to avoid directly crushing individuals with heavy equipment.

4.B.2 – Willow flycatcher - Re-survey habitat within ¼ mile of the project area before construction to ensure that no individuals are present that could be directly disturbed by construction activities OR construction would begin after the WIFL limited operating period (LOP), which ends August 31 (to ensure that the young have fledged the nest).

4.B.3 – Sandhill cranes - Either construct the project outside of the Limited Operating Period (LOP), which is after August 1, or survey for cranes within a half-mile of the project area to determine presence and location prior to any disturbance.

4.B.4 Yellow Warbler – Re-survey habitat within ¼ mile of the project area before construction to ensure that no individuals are present that could be directly disturbed by construction activities OR construction would begin after the Yellow Warbler limited operating period (LOP), which ends August 31 (to ensure that the young have fledged the nest).

**Plan Requirements:** Equipment contracts shall specify that construction is to begin after August 31 and turtle surveys.

**Timing:** This measure shall be implemented at the time of construction contract signature, and turtle surveys prior to moving equipment into new work areas.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to ensure that surveys are conducted. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project.

The following mitigation measure is recommended in order to reduce impacts to fisheries:

**Mitigation Measure 4C.**

4.C. Trout - capturing (via electroshocking) and moving trout out of each immediate work area.

**Plan Requirements:** Equipment contracts shall specify that native fish need to be moved out of work areas in conjunction with construction activities.

**Timing:** This measure shall be implemented at the time of construction contract signature, and prior to moving equipment into each work area.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to ensure that fish are moved. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project.

**3. Cultural Impacts:** Although a surface survey has been completed, this does not fully eliminate the chance of subsurface remains within the project boundary. To avoid potential impacts to cultural resources resulting from the proposed project, the following mitigation measures shall be required:

**Mitigation Measure 5A.** If project ground disturbance should expose a cultural deposit, it is recommended that the disturbance stop until an archeologist can evaluate the material. In the event human remains are discovered during project activity, existing law requires that project managers contact the county coroner. If the remains are determined to be of Native American origin, both Native American Commission and any identified descendants shall be notified.

**Plan Requirements:** Equipment contracts shall include the above language and operators instructed in the field prior to beginning work.

**Timing:** This measure shall be implemented during all site preparation and construction activities.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to ensure that cultural resources are protected. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project. Should cultural resources be discovered, the Department of Planning and Building Services shall coordinate with Plumas Corporation and ensure that appropriate authorities are contacted to avoid damage to cultural resources and determine appropriate action. Should human skeletal remains be encountered, State law requires immediate notification of the County Coroner. Should the County Coroner determine that such remains are in an archaeological context, the Native American Heritage Commission in Sacramento shall be notified immediately, pursuant to State law, to arrange for Native American participation in determining the disposition of such remains."

**4. Geology and Soils Impacts:** To minimize soil erosion to a less than significant level, the following mitigation measure is required:

**Mitigation Measure 6A.** Divert water around the work areas.

**Mitigation Measure 6B.** Vegetate, seed, and mulch the newly sloped banks, fish passage structures, and other disturbed areas.

**Mitigation Measure 6C.** Construction shall occur during the low flow period, and coincide with the most favorable moisture conditions on the meadow (i.e. a dry meadow surface).

**Mitigation Measure 6D.** Topsoil and any organic material in the area of excavation would be removed and stockpiled adjacent to the bank. When the bank has been sloped, the stockpiled topsoil with associated organics and native seed bank would be spread on the bank.

**Mitigation Measure 6E.** All desirable plant material that would be impacted, would be removed and transplanted. Locations of transplants are prioritized according to need for maximum soil protection in areas of potentially high stress such as: 1) the bottom half of the newly sloped bank, 2) the top half of the newly sloped bank, 3) outcurves, 4) fish passage bank and floodplain areas.

**Mitigation Measure 6F.** All equipment travel and haul routes would be restricted to the smallest area possible, and via existing access roads. Equipment travel on these roads would be limited to moving equipment in to start and out when finished. Any additional compaction to these roads would be scarified perpendicular to expected surface water flow and dressed with scattered organic material if necessary.

**Mitigation Measure 6G.** Staging areas and temporary haul routes used during the project would be subsoiled to the full depth of compaction to restore soil porosity, perpendicular to surface flow directions. Areas with residual meadow sod would only be lightly scarified to preserve sod integrity. The emphasis is on the least soil disruption while loosening the soil. Extensive mixing or plowing can have a negative effect on soil microorganisms. This technique has been successful in loosening the soil, restoring soil porosity, providing a high infiltration capacity, and thereby reducing cumulative watershed effects.

**Plan Requirements:** Equipment contracts shall include the above language and operators instructed in the field prior to beginning work.

**Timing:** This measure shall be implemented during all site preparation and construction activities, and completed before equipment leaves the area.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to ensure that erosion control practices are followed. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project.

## **5. Hazards and Hazardous Materials Impacts:**

**Mitigation Measure 8A.** Equipment would be re-fueled and serviced outside of the riparian area.

\*

**Plan Requirements:** Equipment contracts shall include the above language and operators instructed in the field prior to beginning work.

**Timing:** This measure shall be implemented during all site preparation and construction activities, and completed before equipment leaves the area.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to



ensure that hazardous materials are kept out of the riparian area. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project.

**6. Water Quality Impacts:** Some of the mitigations to protect soils also protect water quality. To further minimize hydrology and water quality impacts to a less than significant level, the following mitigation measures are required:

**Mitigation Measure 9A.** Pump water that subsurfaces into the work areas onto vegetated floodplain so that it can filter through vegetation before re-entering the stream channel.

**Mitigation Measure 9B.** Deploy sedimats® below the work areas in the channel to capture settleable solids that may enter the stream channel.

**Mitigation Measure 9C.** Service and re-fuel equipment outside of riparian areas to prevent harmful materials from being washed into the water.

**Mitigation Measure 9D.** Control Construction in Streamside Management Zones by keeping an effective vegetative filter for sediment generated by erosion from road fills, dust drift and oil traces; maintain existing shade, riparian habitat and channel stabilizing vegetation as much as possible. Maintain as much of the floodplain surface as possible in a resistant, undisturbed condition to limit erosion by flood flows.

**Mitigation Measure 9E.** Minimize stream channel disturbances and related sediment production as much as possible.

**Mitigation Measure 9F.** Collect water quality samples and document water quality data.

**Plan Requirements:** Equipment contracts shall include the above language and operators instructed in the field prior to beginning work.

**Timing:** This measure shall be implemented during all site preparation and construction activities.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to ensure that erosion control practices are followed. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project.

**7. Transportation/Traffic Impacts:** The following mitigation measure will be implemented to ensure traffic safety:

**Mitigation Measure 16A.** Plumas Corporation shall obtain an encroachment permit from Caltrans for Highway 70 traffic and from Plumas County for county road traffic prior to beginning construction.

**Mitigation Measure 16B.** Warning signs shall be placed in both directions on all roads with truck traffic associated with the project in compliance with the encroachment permits.

**Plan Requirements:** Equipment contracts shall include the above language and operators instructed in the field prior to beginning work.

**Timing:** This measure shall be implemented during all site preparation and construction activities.

**Monitoring:** Plumas Corporation employees are to be on-site at all times during construction to ensure that traffic safety practices are followed. The Plumas County Department of Planning and Building Services will ensure that these measures are employed during the construction phase of the project.

## INITIAL STUDY AND CHECKLIST

### Introduction:

This checklist is to be completed for all projects that are not exempt from environmental review under the California Environmental Quality Act (CEQA). The information, analysis and conclusions contained in the checklist are the basis for deciding whether an Environmental Impact Report (EIR) or Negative Declaration is to be prepared. Additionally, if an EIR is prepared, the checklist shall be used to focus the EIR on the effects determined to be potentially significant.

### 1. AESTHETICS

**Environmental Setting:** The treatment areas are within two scenic areas, as designated by the Plumas County general plan: The American Valley Scenic Area, and the Highway 70 Scenic Area. Standards for land development within these areas are: 1) Locate transmission and distribution lines where they may be concealed by vegetation or topographical features; 2) On-premise signs shall not exceed 6 square feet nor exceed the height of any on-site building roof line. Land use protection measures are: 1) Maintain agricultural and rural residential uses; 2) Encourage the nomination of ranch homesites and barns which may qualify for State historic landmark designation or for the National Register of Historic Places; 3) Utilize density transfer to maintain open space qualities of existing pasture and meadowlands and to locate rural residential densities away from important scenic structures; 4) Prohibit off-premise advertising signs.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** Since the project involves stream restoration along Greenhorn Creek in American Valley, most of the standards listed above for scenic areas do not apply. There will be no transmission or distribution lines, nor signage associated with the project (except temporary traffic warnings). Streambank stabilization and fish passage objectives of the project would enhance agricultural and rural residential and uses. There are no historic barns or residences within the treatment areas, and the project would not affect open space.

**Mitigation Measures:** No mitigation is required.

## 2. AGRICULTURE/FOREST RESOURCES

**Environmental Setting:** The project area is primarily agricultural. Forested land covers the slopes surrounding the meadow.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1 2220(g)) or timberland (as defined by Public Resources Code section 4526)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** Implementation of the project is expected to protect and enhance existing agricultural land use. The project would protect existing streambanks from further erosion, and protect irrigation structures from further damage from erosion, while enhancing fish habitat. The project area is not within forest land, and would not affect forest resources.

**Mitigation Measures:** No mitigation is required.

### 3. AIR QUALITY

**Environmental Setting:** The project is in a rural, agricultural environment with low density housing. Air quality is generally good, except occasionally in the winter when temperature inversions can trap fog and smoke in the valley.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** As a stream restoration activity, the project is expected to enhance existing natural environmental air quality with more vegetation growth. There is a potential for increased emissions to the atmosphere from diesel equipment during project construction. Trucks hauling approximately 3500 cubic

yards of material to the Shea Dam site, and 3500 cubic yards of material to the Reid dam site may increase dust from roads. This would be a short-term impact during construction (6-8 weeks over two years).

**Mitigation Measures:** The grading activity will be conducted in a manner in compliance with the rules and regulations of the Northern Sierra Air Quality Management District. Appropriate measures for this type of project include the preparation of a dust control plan. The dust control plan shall contain the following minimum requirements:

**Mitigation Measure 3A.** All material excavated, stockpiled, or graded shall be sufficiently watered, treated, or covered to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering may occur at least twice daily, with complete site coverage, if necessary.

**Mitigation Measure 3B.** All areas with vehicle traffic shall be watered or have dust palliative applied as necessary for regular stabilization of dust emissions.

**Mitigation Measure 3C.** All on-site vehicle traffic shall be limited to a speed of 15 mph on unpaved roads.

**Mitigation Measure 3D.** All land clearing, grading, earth moving, or excavation activities on a project shall be suspended as necessary to prevent excessive windblown dust when winds are expected to exceed 20 mph.

**Mitigation Measure 3E.** All inactive portions of the site shall be covered, seeded, or watered until a suitable cover is established. Alternatively, the applicant shall be responsible for applying County-approved non-toxic soil stabilizers (according to manufacturers specifications) to all inactive construction areas (previously graded areas which remain inactive for 96 hours) in accordance with the local grading ordinance.

**Mitigation Measure 3F.** All material transported off-site shall be either sufficiently watered or securely covered to prevent public nuisance, and there must be a minimum of six (6) inches of freeboard in the bed of the transport vehicle.

**Mitigation Measure 3G.** Paved streets adjacent to the project shall be swept or washed at the end of each day, or more frequently if necessary to remove excessive accumulations of silt and/or mud which may have resulted from activities at the project site.

**Mitigation Measure 3H.** The project proponent shall re-establish ground cover on the site through seeding and watering in accordance with the local grading ordinance.

#### **4. BIOLOGICAL RESOURCES**

##### **Environmental Setting:**

The project area is within Plumas County General Plan constraints for deer winter range and waterfowl nesting areas. The natural environment within, and surrounding, the treatment areas provide habitat for many species other species as well. Habitat types include: riverine, pasture, montane riparian, wet meadow, and lacustrine. Riverine habitat is within an eight-foot deep entrenchment. Complete botany and wildlife reports are included in the project record for this proposal, and are herein included by reference only. The complete reports are available at the Plumas Corporation office at 550 Crescent St., Quincy, CA. The reports are summarized in this section of this Initial Study.

### Botany

The following two sensitive plant species may have potential habitat in the area: *Lupinus dalesae* and *Cypripedium montanum*. The following two special interest plants may also have potential habitat in the area: *Pseudostellaria sierrae* and *Carex sheldonii*. The two special interest plants are not protected by law, nor regulation. Protection is recommended when feasible, but is not required. No occurrences of these plants were found during project-level surveys. There are numerous occurrences of Canada thistle (*Cirsium arvense*), medusahead (*Taeniatherum caput-medusae*) and yellow star thistle (*Centaurea solstitialis*) in the project areas, and surrounding meadow.

### Wildlife

Table 1. Existing California Wildlife Habitat Relationships habitat type acreages in the project area and wildlife analysis area.

CWHR Habitat type	All Treatment Units - Acreage	Total Wildlife Analysis Area <sup>4</sup> Acres
Riverine <sup>1</sup>	8.8	29.8
Montane Riparian <sup>2</sup>	1.5	17.6
Pasture <sup>3</sup>	11	316
Wet Meadow	0	32.8
Lacustrine	0	1.2
Non-wildlife habitat <sup>5</sup>	0	6.6
<b>TOTAL</b>	<b>21.3</b>	<b>404</b>

<sup>1</sup> Acreage based ordinary high water mark

<sup>2</sup> Acreage estimate based on established vegetation within the gully bottom

<sup>3</sup> Terrace above the gully bottom (abandoned floodplain)

<sup>4</sup> Total includes project areas

<sup>5</sup> Roads and buildings

# Integrated Greenhorn Creek Restoration Project Analysis Area

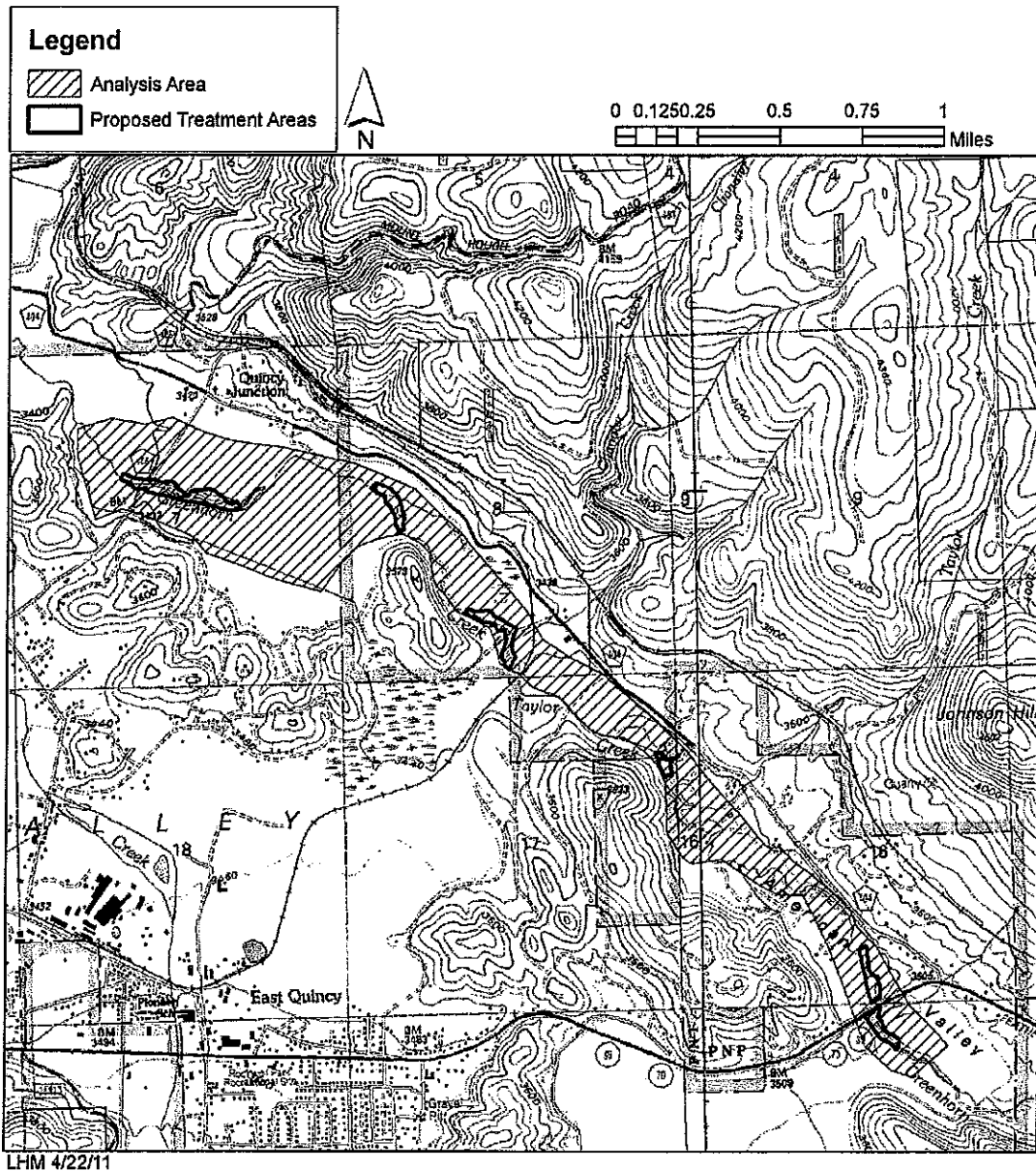


Figure 15. Project treatment areas in the context of the analysis area.

**Riverine habitat** was identified as areas within the bottom of the gully within the ordinary high water mark. Backwater areas formed by irrigation dams on Greenhorn Creek were included in riverine habitat. Riverine channels within the analysis area have degraded to an average of seven feet below the elevation of the meadow. The entrenchment of the channel has resulted in diminished riverine habitat acres that are confined to the bottom of the gully. The current condition of excessive channel erosion from entrenchment widening and deepening, results in riverine habitat with excessive sedimentation and decreased bank vegetation. These characteristics translate to diminished quality of habitat for aquatic life, including macroinvertebrates that are an important food source for many species discussed below.

There is no **lacustrine habitat** within any treatment unit. There is one 1.2 acre farm pond within the wildlife cumulative effects analysis area that is located on private land. This habitat would not be affected by any treatment and will not be discussed further.

In the existing degraded condition, **montane riparian habitat** is confined to the gully. CWHR montane riparian habitat has also been further restricted, due to the poor condition and early seral stage of riparian vegetation within the gully, resulting in only 1.5 acres in the treatment polygons, and 17.6 acres in the rest of the analysis area.

**Wet meadows** are a function of channel/floodplain hydrology and soil types. Before the advent of roads, intensive agricultural and residential use along Greenhorn Creek, wet meadow was likely the predominant habitat type. Meadows within the analysis area were wetter before channel degradation. The entrenched channel throughout the length of the floodplain meadow of the analysis area has greatly altered the channel/floodplain hydrology, resulting in drier meadow conditions. In the existing condition, there are 32.8 acres of wet meadow habitat in the analysis area. There is no wet meadow habitat within the treatment areas. The entrenched channel in the analysis area dries out the meadow by increasing drainage pressure at a lower elevation.

Channel degradation in the analysis area has contributed to some conversion of pre-degradational wet meadow or montane riparian habitat into drier habitats, such as **pasture habitat**. The predominant land use in the analysis area is agriculture. All of the analysis area outside of the entrenchment is in this category (except areas of wet meadow, pond or non-habitat areas). In the existing condition, there are 316 acres of pasture habitat.

**TABLE 2: Threatened, Endangered, Proposed and Sensitive Animal Species that Potentially Occur on the Plumas National Forest, as of April 29, 2010.**

Species	Category
<b>INVERTEBRATES</b>	
Valley elderberry longhorn beetle ( <i>Desmocerus californicus dimorphus</i> )	Threatened
<b>FISH</b>	
Hardhead minnow ( <i>Mylopharodon conocephalus</i> )	Sensitive
<b>AMPHIBIANS</b>	
California red-legged frog ( <i>Rana aurora draytonii</i> )	Threatened
Foothill yellow-legged frog ( <i>Rana boylei</i> )	Sensitive
Mountain yellow-legged frog ( <i>Rana muscosa</i> )*	Candidate/Sens



	itive
Northern leopard frog ( <i>Rana pipiens</i> )	Sensitive
<b>REPTILES</b>	
Pacific pond turtle ( <i>Actinemys marmorata marmorata</i> )	Sensitive
<b>BIRDS</b>	
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Sensitive
Northern Goshawk ( <i>Accipiter gentiles</i> )	Sensitive
California spotted owl ( <i>Strix occidentalis occidentalis</i> )	Sensitive
Great gray owl ( <i>Strix nebulosa</i> )	Sensitive
Willow flycatcher ( <i>Empidonax trailii brewsteri</i> )	Sensitive
Greater sandhill crane ( <i>Grus canadensis tabida</i> )	Sensitive
Swainson's hawk ( <i>Buteo swainsoni</i> )	Sensitive
<b>MAMMALS</b>	
Sierra Nevada red fox ( <i>Vulpes vulpes necator</i> )	Sensitive
American marten ( <i>Martes americana</i> )	Sensitive
Pacific fisher ( <i>Martes pennant pacifica</i> )	Candidate
California wolverine ( <i>Gulo gulo luteus</i> )**	Sensitive/ Candidate
Pallid bat ( <i>Antrozous pallidus</i> )	Sensitive
Western red bat ( <i>Lasiurus blossevillii</i> )	Sensitive
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	Sensitive

\* discussed in this report as Sierra Nevada yellow-legged frog

\*\*As of December 24, 2010, California wolverine is a candidate species.

Several T&E species identified in the list of T&E species provided by the "Federal Endangered and Threatened Species that may be affected by Projects in the Plumas National Forest", updated April 29, 2010, accessed via USFWS web page ([http://www.fws.gov/sacramento/es/spp\\_lists/NFActionPage.cfm](http://www.fws.gov/sacramento/es/spp_lists/NFActionPage.cfm)) (Appendix A), have been eliminated from further analysis, based on past analysis and concurrence from the USFWS (HFQLG BA/BE Rotta 1999, USFWS letter 1-1-99-I-1804 dated August 17, 1999) or due to lack of species distribution and/or lack of designated critical habitat. These species are listed below:

- Winter Run Chinook Salmon (*Oncorhynchus tshawaytsa*)
- Conservancy Fairy Shrimp (*Branchinecta conservatio*)
- Central Valley steelhead (*Oncorhynchus mykiss*)
- Delta Smelt (*Hypomesus transpacificus*)
- Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)
- Central Valley spring-run Chinook salmon (*Oncorhynchus tshawaytsa*)
- Carson wandering skipper (*Pseudocopaeodes eunus obscurus*)
- Critical Habitat for vernal pool invertebrates (Butte County)
- Critical habitat for California red-legged frog

In addition, there is no known habitat, have been no observations, and the Integrated Greenhorn Creek Restoration Project Wildlife Analysis Area is above the elevational range for the valley elderberry longhorn beetle, a threatened species. Therefore, this species will not be discussed further in this document. There is also no suitable habitat and have been no observations of the following sensitive

species in, or near, the Integrated Greenhorn Creek Restoration Project Wildlife Analysis Area: hardhead minnow, northern leopard frog, Swainson's hawk, and all sensitive forest carnivores (Sierra Nevada red fox, American marten, Pacific fisher, California wolverine). Therefore, these seven species will not be discussed further in this document. Sensitive carnivores also are not likely to occupy habitat with as much residential and agricultural activity as occurs in, and around, the analysis area.

The closest known population of California red-legged frogs to the project area is over 30 air miles southwest of the project area, in a drainage that is directly tributary to the pool of Lake Oroville. It would be nearly impossible for this closest known population to get close to colonizing the project area, with numerous reservoirs, and over 80 stream miles between this population and the project area. The nearest critical habitat is located at approximately 2,200 foot elevation, also over 30 air miles from the project area. Abundant surveys have been conducted throughout the Plumas National Forest over the past 15 years, with no new populations found, nor is any critical habitat located within Plumas County. No CaRLF individuals were found during project-specific surveys for the Integrated Greenhorn Creek Restoration Project. Therefore this species would not be affected by the Proposed Action, and will not be discussed further.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Impact Discussion:

Project activities are expected to enhance Plumas County designated deer winter range and waterfowl nesting habitats by improving riparian habitat and vegetation along the stream channel, which would provide cover for these wildlife species.

No sensitive plants were detected during project-level field surveys. However, if undetected plants occur in the area, direct adverse effects could occur to sensitive plants during stream channel rehabilitation and bank stabilization construction work. Using heavy machinery to perform restoration activities has the potential to directly impact sensitive plants by crushing plants, displacing soil and plants, or smothering plants with soil. Direct effects are unlikely since no sensitive plants were found. However, any undetected sensitive plants could be affected. **Mitigation** includes flagging and avoiding any sensitive plants that may be found during construction.

Indirect adverse effects to sensitive plants would be most likely via the potential for noxious weeds. Noxious weeds displace native plant habitat and degrade watershed functions. Noxious weeds can be spread throughout the project areas in road materials and mulch, and spread from existing occurrences within the project areas. Noxious weeds would continue to pose a threat to native plant habitat and sensitive plant species under any management or activity. However, with proposed treatments involving ground disturbance in six areas, noxious weeds can more easily spread. Once established, noxious weeds can be difficult to control and eliminate from an area. They are already well established in and around the treatment areas. Without mitigation, noxious weeds could easily proliferate. Grazing does not occur in the project area, but does occur around the project area. **Mitigation** includes flagging and avoiding noxious weed areas, cleaning equipment, using weed free material and mulch, removing plants and/or seed heads prior to construction, and removing noxious weed plants for three years after construction.

Adverse effects to botanical resources are not expected as a result of implementation of the project for the following reasons: the project area has been adequately surveyed for plant species of concern, and none were found; any species of concern that are discovered during project activities will be flagged and avoided if possible, while still carrying out the intent of the project; and management practices to control noxious weeds would be implemented.

Table 3. California Wildlife Habitat Relationships habitat type acreages in the existing condition compared to expected acreages under the Proposed Action\*.

CWHR Habitat type	All Treatment Units		Total Wildlife Analysis Area	
	Existing	Proposed Project	Existing	Proposed Project
Riverine	8.8	8.8	29.8	29.8

<b>Montane Riparian</b>	1.5	1.8	17.6	17.9
<b>Pasture</b>	11	10.7	316	315.7
<b>Wet Meadow</b>	0	0	32.8	32.8
<b>Lacustrine</b>	0	0	1.2	1.2
<b>Non-wildlife habitat</b>	0	0	6.6	6.6
<b>TOTAL</b>	<b>21.3</b>	<b>21.3</b>	<b>404</b>	<b>404</b>

\* See footnotes under Table 1.

As can be seen in the above table the project is expected to alter existing riverine and pasture habitat, and create montane riparian habitat. Direct effects to habitat include: 1) temporarily routing channel flows from the existing channel into a bypass channel during construction; 2) increasing the percentage of pool (versus riffle) habitat; 3) increasing bank angle (from vertical to a 1:1 slope) so that vegetation can become established; 4) removing riparian vegetation from the gravel bar, and planting it on the banks; 5) increasing riparian vegetation (sedges, willows, and alders where available) on the newly sloped bank; 6) slightly decreasing pasture habitat to improve the bank angle on vertical banks; 7) increasing montane riparian habitat by planting stream banks that currently do not support vegetation; 8) temporarily increasing sedimentation during construction, that would be minimized by mitigations measures; and 9) improving water quality of riverine habitat in the long term by decreasing sedimentation from eroding banks. Indirect effects to habitat would be due to disruption of the channel during construction, which would cause a temporary reduction (less than six months) in aquatic macro-invertebrates that are prey for Pacific pond turtles, greater sandhill crane, willow flycatcher, pallid bat, Townsend's big-eared bat, western red bat, and yellow warbler. The reduction in sediment, however, is expected to improve habitat for macroinvertebrates, and thus indirectly improve habitat for those species by increasing their prey base. Mitigations described in this document for soil and water quality protection would also protect macroinvertebrates. In the long term, the expected reduction of sediment due to the project is expected to benefit macroinvertebrate habitat through the reduction of sedimentation, and increased shade on sloped and vegetated banks.

Discussion of expected project effects on individual species follows:

The project would not directly or indirectly affect the **Sierra Nevada yellow-legged frog**, nor **foothill yellow-legged frog** because neither species occurs in, or within six miles of, the analysis area.

The **Pacific pond turtle** has been known to occur within the analysis area, however this species was not detected during 2010 surveys. **Mitigation to protect turtles** includes re-surveying the project area prior to construction to avoid directly crushing individuals with heavy equipment. Turtles may benefit in the long term from the project, with an increase in basking sites on the newly sloped bank and on the vane boulders.

The turtle would be negatively indirectly affected in the short term by a short term decline in macroinvertebrate prey, and would indirectly benefit in the long term, due to less sedimentation that is expected to benefit macroinvertebrate populations.

While the habitat does meet typical foraging habitat characteristics, **bald eagles** have been observed within the analysis area, and it is likely that they use the analysis area for infrequent foraging. There is no nesting habitat within or near the analysis area. There is a potential for temporary direct disturbance from project activities to foraging bald eagles due to noise and equipment movement during construction. The effect is likely to be minimal considering the expanse of the valley surrounding Greenhorn Creek, and the length of Greenhorn Creek.

There is no foraging or nesting habitat within or near the analysis area for the **northern goshawk** and the **spotted owl**. The open meadow within the analysis area provides foraging habitat for **great gray owl**. The project would not affect forested habitat on which these three species depend. None of these three species are not known to exist in or near the analysis area, therefore they would not be affected by the project.

There is **willow flycatcher** (WIFL) habitat within the analysis area and within some of the treatment areas. No WIFL were detected during field surveys. However, because of the suitable habitat, **mitigation** would include re-surveying habitat within ¼ mile of the project area before construction to ensure that no individuals are present that could be directly disturbed by construction activities OR construction would begin after the WIFL limited operating period (LOP), which ends August 31 (to ensure that the young have fledged the nest). If WIFL are detected during surveys, construction would be delayed until after the LOP. Direct impacts to individuals would be avoided with this mitigation, although it is possible that individuals could be missed during a survey. Short-term direct impacts to habitat include uprooting willow plants with heavy equipment during construction to re-plant on the floodplain bench on the treatment bank. Short-term indirect impacts to habitat include the temporary reduction (less than six months) in macroinvertebrates. WIFL feed on winged adult macroinvertebrates. This would be a minimal impact because of the small area of disturbance (390 feet of channel and 1.2 acres) in the context of 3.9 miles of channel in the analysis area. In the long term, the reduction in sediment due to the project is expected to improve habitat for macroinvertebrates, thereby indirectly benefitting WIFL.

**Sandhill cranes** are known to occur, and have nested, within the analysis area. They are sensitive to human disturbance and grazing activity during nesting. To avoid direct impacts to individuals, **mitigation** includes either constructing the project outside of the Limited Operating Period (LOP), which is after August 1, or surveying for cranes within a half-mile of the project area to determine presence and location prior to any disturbance. If cranes are detected, construction would either be delayed, or it would proceed on schedule if it were determined by a biologist that the cranes could be avoided. With this mitigation measure, there should be no direct impact to individuals, however, it is possible that individuals could be missed in a survey. Since sandhill cranes utilize wet meadow areas, they are not likely to use the gullied channel environs for foraging, and it is unlikely that the project would have an indirect effect on sandhill cranes.

**Pallid bat**, **Townsend's big-eared bat**, and **western red bat** are all known to occur in Plumas County. Detection of these species is difficult, and while project-specific surveys were not completed, it must be assumed that sensitive bat species occur within the analysis area. Roosting habitat does not occur within the analysis area. Pallid bats prefer caves, crevices, mines, or occasionally, hollow trees or old buildings. Townsend's big-eared bats are known within one mile west of the analysis area. The ponderosa pine forests surrounding the analysis area can provide habitat for this species, but this habitat is not within the analysis area. Large cottonwoods and other large riparian trees that would be preferred by western red bats do not occur in the entrenched riparian area within the analysis area. Trees within the entrenched channel tend to be smaller in diameter than trees preferred by this species. Western red bats are known to occur 25 miles east of the project area, but not in American Valley.

Because these bats can have a wide range, the project has a potential for short-term, temporary disruption of riparian foraging, commuting, and roosting habitat for each of these species during construction due to heavy equipment noise and movement. However, this type of disturbance, (which occurs during daylight hours, when foraging is not occurring), is expected to be minimal. There would be no long term disturbance to potential roosting habitat because trees would not be affected by the project. The project remains within the immediate area of the gullied stream channel. Adult winged macroinvertebrates are an important food source for these bat species. As discussed above, species that rely on this food source would be temporarily indirectly affected by a reduction in macroinvertebrates due to construction. This

effect is expected to be minimal due to adjacent areas that would not be affected by the project. Bats can fly and have unusually large home ranges for their size and are able to utilize multiple habitat settings for different purposes. In the long term, bats would indirectly benefit from the project because of the decreased sedimentation that would benefit macroinvertebrate populations.

For **yellow warbler**, the analysis of effects is in terms of the change in acreage and quality of riparian habitat. Direct effects to habitat includes the potential removal of willow plants that are located on gravel bars opposite of treatment banks, and re-planting them on the treatment bank. Pasture habitat would be affected as the treatment bank would be laid back, and converted into montane riparian habitat by planting vegetation. Survival of willows has been excellent (approximately 90%) in similar projects on Spanish Creek and Wolf Creek, survival of other species is expected to be 20-50%. Gravel bar would be re-planted more sparsely than currently exists, so that high flows can easily access and spread across the gravel bar, thus reducing the erosive force of water in the channel. In the short term (1-3 years), the project would increase vegetation on the eroding banks, and decrease vegetation on opposing gravel bars, thus altering the existing forces of resistance within the project areas. This re-arrangement of vegetation is expected to allow the vegetation on the newly sloped bank to take hold and develop strong roots. In the long term, vegetation on both banks is likely to equalize. By the time vegetation becomes more resistant on the gravel bars (3-5 years), it is expected that the opposite banks will have enough root strength to withstand the forces of flowing water. Acres of riparian habitat, canopy cover, and tree size class would remain the same, however, the location of these habitat features would change from the gravel bars and top of the eroding banks, to the newly sloped banks. **Mitigation** for yellow warbler is the same as for willow flycatcher.

**Rainbow and brown trout** inhabit the project area, and provide recreational fishing opportunities. Fish population estimates from the mouth of Greenhorn Creek in August 2001 were 469 brown trout per mile and 70 rainbow trout per mile. The project is expected to improve habitat for trout in the long term in the following ways: increase pool habitat; increase cover components such as boulders and overhanging bank vegetation; decrease sedimentation, thus improving habitat for spawning and macroinvertebrate prey; create upstream fish passage, thus expanding habit areas; and reduce water temperatures by increasing shade along the stream banks. In the short term, trout may be negatively impacted by increasing sedimentation during construction, however, mitigations to protect water quality should minimize this impact. **Mitigation** to protect all fish species includes capturing (via electroshocking) and moving fish out of each immediate work area. Because of mitigations, trout and other fish species are expected to be minimally affected by the project in the short term. Fish habitat and macroinvertebrate prey are expected to recover and improve within one year after construction.

#### **Summary of Biological Resource Mitigation Measures:**

**Mitigation Measure 4A.** Flag and avoid any sensitive plants that may be found during construction. Flag and avoid noxious weed areas, cleaning equipment, using weed free material and mulch, remove plants and/or seed heads prior to construction, and remove noxious weed plants for three years after construction.

#### **Mitigation Measure 4B.**

4.B.1 Pacific turtles - Re-survey the project area prior to construction to avoid directly crushing individuals with heavy equipment.

4.B.2 – Willow flycatcher - Re-survey habitat within ¼ mile of the project area before construction to ensure that no individuals are present that could be directly disturbed by construction activities OR construction would begin after the WIFL limited operating period (LOP), which ends August 31 (to ensure that the young have fledged the nest).

4.B.3 – Sandhill cranes - Either construct the project outside of the Limited Operating Period (LOP), which is after August 1, or survey for cranes within a half-mile of the project area to determine presence and location prior to any disturbance.

4.B.4 Yellow Warbler – Re-survey habitat within ¼ mile of the project area before construction to ensure that no individuals are present that could be directly disturbed by construction activities OR construction would begin after the Yellow Warbler limited operating period (LOP), which ends August 31 (to ensure that the young have fledged the nest).

**Mitigation Measure 4C.**

4.C. Trout - capturing (via electroshocking) and moving trout out of each immediate work area.

**5. CULTURAL RESOURCES**

**Environmental Setting:** The following is summarized and excerpted from the “Heritage Resource Survey for the Integrated Greenhorn Creek Restoration Project”, (December 2010) by Diane McCombs of McCombs Archeology (herein incorporated by reference): Prehistoric sites have been recorded on private and public lands in all of the valleys in Plumas County, including American Valley. Farris and Smith in the late 1800’s described agricultural use in the area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Impact Discussion:** The archeological field survey of the six discrete project areas located one potentially historic structure, which is the Reid irrigation dam. The consulting archeologist recommends that the site is not eligible for listing in the National Register of Historic Places, and is not a historic property as defined in 36 CFR 800.4. A fish passage structure is proposed just downstream of the dam, which currently is a barrier to fish passage. The structure itself would not touch the dam, nor would construction activities affect the dam. The top of the structure would be 34 feet downstream of the dam apron, and continue further downstream for 333 feet. The fish passage structure would raise the elevation of water in the stream channel, resulting in inundation of the apron of the dam, and a one foot drop off the base of dam. There is currently a 7.4 foot drop off the base of the dam. By decreasing the hydraulic drop off of the dam, the fish passage structure is expected to protect the dam from damage due to further erosion of the bed and banks below the dam.

**Mitigation Measures:**

**Mitigation Measure 5A.** If project ground disturbance should expose a cultural deposit, it is recommended that the disturbance stop until an archeologist can evaluate the material. In the event human remains are discovered during project activity, existing law requires that project managers contact the county coroner. If the remains are determined to be of Native American origin, both Native American Commission and any identified descendants shall be notified.

**6. GEOLOGY AND SOILS**

**Environmental Setting:** Greenhorn Creek and its environs through American Valley are geologically comprised of sedimentary and metasedimentary rocks, specifically, Quaternary alluvium and Paleozoic marine. Durrell (1987) describes American Valley as having once been a lake resulting from the damming of Spanish Creek. The dam was caused by movement of a fault located at the base of Grizzly Ridge between Spring Garden and Keddie. The valley lies in the Plumas Trench between the Sierra Nevada Ridge and Grizzly Ridge.

The basin is complexly faulted and must be composed of many fault-bounded blocks. The hills in the central part of the valley are the tops of high blocks that stood as islands in the lake. The outline of the basin, like that in Indian Valley is that of a drowned stream system with arms that extended up Spanish, Greenhorn, and Thompson creeks.

The orographic crest of the Sierra Nevada range is less than 10 air miles northeast of the project area, and defines the Greenhorn Creek watershed boundary. Average annual precipitation in the analysis area is 45 inches with 16 inches of run-off. The bulk of annual precipitation falls as snow from Pacific frontal systems during the winter (October- May) with a dry summer. Major watershed scale floods are the result of long duration, intense, rain-on-snow, storm events (1955, 1986, 1997).

The project area is located at the bottom of a 42,226 acre watershed. Elevation in the watershed above the project area peaks at 7,779 feet. The elevation of the project area is approximately 3,500 feet. Along ridgetops and steep side slopes, boulders and rock outcrops dominate the landscape. Soil types within the project area are in Greenhorn, Keddie and Plumas Series. The valley slope within the project area is 0.4%. Before degradation, the meadow surface was the floodplain of Greenhorn Creek, with overbanking flows occurring with a frequency somewhere between 2-10 years. The meadow was a moist to wet riparian area floodplain with stable soils, anchored by wet or mesic vegetation complexes with deep, dense root systems and excellent infiltration. In the current condition, the channel has degraded to an elevation that varies between four and eleven feet below the meadow surface. Only the most infrequent flood flows can access the now-abandoned meadow floodplain. Treatment area banks are characterized by a vertical slope, with on-going bank sloughing on one side, and expanding gravel bars on the other side, which further push stream flow into the eroding bank. A new floodplain is forming within the gully, and will continue to erode until an adequate floodplain width is reached.

Systemic channel incision has severely impacted the functionality of the meadow floodplain and moisture characteristics of soils along Greenhorn Creek throughout the 404 acre analysis area. Soil moisture is currently managed for agricultural productivity with irrigation.

**Soil Characteristics**

The vast majority of the analysis area and project areas are comprised of Greenhorn Series soils, which consists of very deep, poorly drained soils on floodplains, formed in mixed alluvium weathered from



predominately metasedimentary rocks and hydraulic mine tailings. Within the project area, soils stratify from the surface to 60 inches as loam, down to fine sand to loam, and to silt loam. In descriptions for water management for this soil, it is noted that cut banks can cave in.

Permeability of the soil is moderate. Available water capacity is high. Effective rooting depth is 20-30". Run-off is slow, and the hazard of water erosion is slight. A seasonal high water table is at a depth of 20-30" from December through May. This soil is subject to flooding in 3 out of 10 years for brief periods from December through March.

This unit is used for irrigated hay and pasture.

If this unit is used for hay and pasture, the main limitations are poor drainage and flooding. Wetness limits the choice of plants and the period of cutting or grazing. Flooding should be considered before any capital improvements are installed. The risk of flooding can be reduced by the use of levees. Irrigation water needs to be applied carefully to avoid raising the water table.

This soil is fair to poor for grain and seed crops, grasses and legumes, and good for wild herbaceous plants and wetland plants.

The other two other soils that would be impacted by proposed project activities are the Keddie Series, and the Plumas Series. Since neither the Massack Series and nor Riverwash would be impacted by the Proposed Action or other foreseeable future actions on private land associated with the Integrated Greenhorn Creek restoration Project, they will not be discussed further. Similar to the Greenhorn Series, the Keddie Series also consists of very deep, poorly drained soils on floodplains and alluvial fans, formed in mixed alluvium. It consists of loam on top, stratified down to sandy loam to clay loam. The Plumas series consists of very deep, well-drained soils on alluvial fans, formed in mixed alluvium, predominately from metasedimentary rocks. It consists of very gravelly sandy loam on top, stratified down to extremely gravelly loamy sand. Similar to the Greenhorn series, both of these soils are fair to poor for grain and seed crops, grasses and legumes, and good for wild herbaceous plants and wetland plants. As mentioned above, with the incision of the Greenhorn Creek channel, moisture characteristics of all of these soils has been altered so that flooding is less frequent, and drainage is increased. Grasses are commonly grown by agriculturalists under current conditions with the use of irrigation.

**Table 4: Characteristics of soils within the analysis area (Soil Resource Inventory, USDA- Plumas NF, 1988).**

Soil Type (and map unit number)	% of analysis area	% of treatment units	erosion factor (K*)	pH
Greenhorn (23)	75%	85%	0.32-0.43	6.1-7.3
Keddie (24)	17%	10%	0.32	6.1-7.3
Plumas (32)	5%	5%	0.15	6.1-7.3
Massack (30)	2%	0	0.32-0.37	6.1-7.3
Riverwash (36)	1%	0	Not analyzed	Not analyzed

\* K indicates the susceptibility of a soil to sheet and rill erosion by water, ranging from 0.05 to 0.69, the higher the K factor, the more the soil is susceptible to sheet and rill erosion by water.

#### **Soil Productivity**

Three criteria used for indicating the impacts of land management activities on soil productivity include the annual rate of soil loss, the porosity of the soil, and the maintenance of organic matter within the soil. Soil productivity is the inherent capacity of a soil to support appropriate site-specific biological resource management objectives, which includes the growth of specified plants, plant communities, or a sequence of plant communities to support multiple land uses (USDA Forest Service 2010).

#### Soil Productivity - Annual Rate of Soil Loss

Within the project and analysis areas, the primary process for soil erosion is lateral gully wall migration that is associated with flowing water and excessive bedload deposition on gravel bars. Existing effective soil cover on meadows within the project area, as well as the entire analysis area is estimated at greater 70%.

Functional alluvial channel/floodplain systems are, by definition, net depositional landscape features. By serving as flood flow spreading and dispersal areas, water velocities of sediment-laden flows decrease, thus allowing sediments to deposit. Under the existing condition with the incised channel, the depositional function is no longer occurring on the historic floodplain meadow feature. Streambanks are eroding at accelerated rates, resulting in transportation of those sediments downstream. In the absence of long-term site specific bank erosion studies (i.e. bank erosion pins), the typical methodology for calculating long-term bed-and-bank erosion rates of entrenched channels is to quantify the 'void' represented by the gully and extrapolate over a given time period. The following table summarizes gully and valley-wide cross-sections surveyed throughout the analysis area. It is generally accepted that most of the present entrenched channels have incised within the last 100 years. A rough estimate of the average void (gully width x depth) in the analysis area is approximately 1,085 sq ft, multiplied by 20,618 feet of bank is 828,538 cubic yards, divided by 100 years is approximately 8,285 cubic yards per year.

Table 5. Channel and gully dimensions in the analysis area. All units are in feet.

Cross-section	bankfull width	bankfull area	gully width	gully depth
frn1	57	93	100	6.1
frn2	79	198	98	5.55
0-A	41	127	196	10.62
1	45	117	165	11.13
1-a	21	44	90	10.5
Porter	46	139	130	9.4
blw Mill-Nick bridge	36	65	75	9.45
thon-miller	58	121	202	7.2
Lower Thon	87	231	178	6.2
DS of Thompson	40	77	166	5.7
ClIns-Jcby	48	66	342	4
Reid1	56	132	320	8.8
Reid2	76	142	353	9
Reid3	36	86	148	4.8
Reid4	38	65	245	5
Reid5	40	116	130	6.5
Reid6	40	52	100	5.8
UpValley	46	135	108	11.03
12	57	81	133	6.3
LoValley	38	96	71	6.6

Labbe	70	216	90	4.33
Span-Grnhn	43	126	75	4.56
Bresciani	30	39	61	7

### Soil Productivity - Porosity

Soil porosity is the volume of pores in a soil that can be occupied by air, gas or water. Porosity varies, depending on the size distribution of the particles and their arrangement with respect to each other. Soil compaction increases the bulk density and decreases the porosity of soils. Compaction can slow plant growth and impede root development. Soil compaction restricts percolation and can cause poor water infiltration, potentially resulting in increased overland flow during high precipitation events. Compaction increases soil strength, potentially causing vegetation to use more energy to access nutrients and water, resulting in a decline of above ground plant growth.

Results of the North American Long-Term Soil Productivity Study, summarized for study sites with at least 10 years of response, indicate that the effect of compaction on biomass productivity differs primarily depending upon the soil texture (Powers et al 2005). Reduced biomass productivity was observed for soils with high clay content. However, compacted sandy soils actually indicated increased biomass productivity. No significant change in biomass productivity was indicated for loamy soils. Loam is the primary texture of soils within the project area and analysis area, with little clay. Therefore, it is not likely that significant biomass productivity has been lost due to compaction under existing conditions in the project area or analysis area

### Soil Productivity - Organic Matter and Soil Nutrients

Organic matter is the cache for plant nutrients and is the primary source of plant-available nitrogen, phosphorus and sulfur. Organic material includes plant litter, duff, and woody material. Meadow sod and accumulated litter moderate soil temperature and moisture, providing an environment favorable for the soil biota that recycle plant and animal remains. Surface organic material also protects soils from erosion, and enhances infiltration and hydrologic function. Observations of soil cover greater than 70% within the project area and analysis area ensures that there is adequate organic matter and associated nutrients under existing conditions.

### Buffering Capacity of the Soil

Buffering capacity refers to the soil's ability to resist a significant change in pH, or acidity. The cation exchange capacity of soils gives them most of their buffering capacity. Typical pH levels for the soil types in the project area are listed in the above table.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Publication 42.				
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### Impact Discussion:

##### Annual rate of soil loss

Potential loss of soil during construction would be minor because mitigation measures and Best Management Practices would be employed to protect soil and water resources. **Mitigations** to protect soil and water resources include diverting water around the work areas, pumping water that subsurfaces into the work areas onto vegetated floodplain, employing sediments below the work areas, and vegetating, seeding, and mulching the newly sloped banks, fish passage structures, and other disturbed areas. One of the express purposes of the proposed project is to directly reduce soil loss due to bank erosion within the project areas. This would be accomplished by laying back and vegetating eroding banks, and installing boulder vanes to direct flow energy vectors away from the bank and into the center of the channel. The boulder vanes would help direct the energy of flowing water into maintaining vertical pool depth rather than lateral bank erosion.

##### Porosity

The project would require the use of heavy equipment to move soil to lay back banks, recontour gravel bars, and construct riffle-pool fish passage structures. There is a potential for heavy equipment to directly impact soil porosity by increasing compaction. Heavy equipment with tracks would be used where possible, which have less weight per square inch than wheeled vehicles, thereby minimizing the potential for compaction. Construction would occur during the dry time of year, when soils are drier, and less susceptible to compaction. Soil compaction is mostly a concern at moderate moisture levels. The dry nature of the soils in late summer or early fall, when the project area would be constructed, would not lead to compaction due to heavy equipment. Heavy equipment travel on the terraced floodplain, including trucks hauling in rock, would be minimized in order to minimize compaction. Neither bank sloping nor gravel bar re-contouring would affect soil porosity in the long term, as the soil structures would likely remain the same.

##### Organic Matter and Nutrients

Organic matter and soil nutrients may be temporarily decreased during construction, however, project activities would be controlled by Best Management Practices (BMPs), and soil disturbance outside of the sloped bank and gravel bar would be minimal. Mitigation measures includes seeding all disturbed areas with native seed and mulching with weed-free mulch after construction. The mulch would replenish organic matter that could be lost due to construction. Project BMPs also require that equipment access routes and staging areas not be mechanically cleared in order to retain the majority of organic matter and nutrients in place. Topsoil on the top of the bank to be sloped would be removed, stock-piled, and spread on the sloped bank in order to retain organic matter and nutrients.

#### **Buffering Capacity**

No materials would be added to the soil that would alter the reaction class, buffering or exchange capacity. There would be no change in the trend of buffering capacity from existing conditions.

#### **Mitigation Measures:**

To minimize soil erosion to a less than significant level, the following mitigation measures are required:

**Mitigation Measure 6A.** Divert water around the work areas (see Water Diversion Plan in project description).

**Mitigation Measure 6B.** Vegetate, seed, and mulch the newly sloped banks, fish passage structures, and other disturbed areas.

**Mitigation Measure 6C.** Construction shall occur during the low flow period, and coincide with the most favorable moisture conditions on the meadow (i.e. a dry meadow surface).

**Mitigation Measure 6D.** Topsoil and any organic material in the area of excavation would be removed and stockpiled adjacent to the bank. When the bank has been sloped, the stockpiled topsoil with associated organics and native seed bank would be spread on the bank.

**Mitigation Measure 6E.** All desirable plant material that would be impacted, would be removed and transplanted. Locations of transplants are prioritized according to need for maximum soil protection in areas of potentially high stress such as: 1) the bottom half of the newly sloped bank, 2) the top half of the newly sloped bank, 3) outcurves, 4) fish passage bank and floodplain areas.

**Mitigation Measure 6F.** All equipment travel and haul routes would be restricted to the smallest area possible, and via existing access roads. Equipment travel on these roads would be limited to moving equipment in to start and out when finished. Any additional compaction to these roads would be scarified perpendicular to expected surface water flow and dressed with scattered organic material if necessary.

**Mitigation Measure 6G.** Staging areas and temporary haul routes used during the project would be subsoiled to the full depth of compaction to restore soil porosity, perpendicular to surface flow directions. Areas with residual meadow sod would only be lightly scarified to preserve sod integrity. The emphasis is on the least soil disruption while loosening the soil. Extensive mixing or plowing can have a negative effect on soil microorganisms. This technique has been successful in loosening the soil, restoring soil porosity, providing a high infiltration capacity, and thereby reducing cumulative watershed effects.

## 7. GREENHOUSE GAS EMISSIONS

**Environmental Setting:** The extent to which greenhouse gases are emitted or sequestered in the project area is unknown at this time.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** One excavator would be used for project construction for approximately construct the project for approximately 10 weeks. At a rough consumption rate of 50 gallons per ten-hour day, this would roughly equate to approximately 2,000 gallons of diesel fuel. With 22.2 lbs carbon emitted from a gallon of diesel, or 22 tons of carbon dioxide emitted during construction from the excavator. Trucks hauling in approximately 7,200 cu yds of material for the fish passage structures, and 920 cu yds for boulder vanes would require 406 trips; three trips/day /truck, or 135 truck-days x 50 gallons/day = 6,750 gallons of fuel x 22.2 lbs carbon/gallon, and divided by 2000lbs/ton = 75 tons of carbon dioxide emitted by the trucking. For construction and materials, the project would emit 97 tons of carbon dioxide. The vegetation improvement on stable banks and the fish passage structures would sequester some carbon in the long term, but that amount is unknown, and is somewhat negligible.

**Mitigation Measures:** None required.

## 8. HAZARDS AND HAZARDOUS MATERIALS

**Environmental Setting:** The project area is in a natural setting. There are no known hazards, nor hazardous materials, in the project area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Impact Discussion:** The project areas are in the stream channel and would not impact any residences. The heavy equipment used to construct the project would be fueled with diesel fuel. A spill of this material could be hazardous to the environment. **Mitigation** is to re-fuel and service equipment outside of the riparian area, to ensure that an accidental spill would not harm the environment. The project areas are near a stream channel, where water is available, and the risk of wildfire is low. In the event of a fire, the excavator could bucket creek water to douse flames.

**Mitigation Measures:**

**Mitigation Measure 8A.** Equipment would be re-fueled and serviced outside of the riparian area.

## 9. HYDROLOGY AND WATER QUALITY

**Environmental Setting:** Greenhorn Creek is a 44,695 acre (70 mi<sup>2</sup>) watershed, with 45 inches of average annual precipitation. The 1994 study found that of the 273 miles of stream channel in the watershed, 153 miles are in fair to poor condition and in an eroding condition. Of those channel miles, 19 total miles are a

C-type channel (i.e. a slope and form similar to the reach through the analysis area), with 13 of those miles (68%) in an eroding condition.

In 1991, the FR-CRM undertook a stream and fish habitat restoration project on 0.75 miles of Greenhorn Creek within the analysis area. That work consisted of meander re-alignment using boulders, log revetments, and revegetation. High flows and sediment load in 1995 re-configured the channel once again, causing the abandonment of many of the structures. In 2001, boulder vanes were installed within a portion of the previously treated area above Highway 70. Boulder vanes have proven to be a successful technique when treating eroding banks that must remain within the confines of an existing entrenchment, and the boulder vanes continue to work as designed in the Farnworth treatment area. (Proposed work associated with the Integrated Greenhorn Creek Restoration project would extend that vane treatment further downstream.)

In 1999, the FR-CRM established a long-term monitoring reach on Greenhorn Creek, following the Stream Condition Inventory (SCI) protocol developed by Region Five of the US Forest Service. The reach is located just above the confluence of Greenhorn Creek with Spanish Creek. Geomorphic, water quality, and biological data were collected in 1999, 2001 & 2003. The following discussion is excerpted from the FR-CRM's 2003 Watershed Monitoring Report:

Geomorphic changes at this site include a barely perceptible increase in average bankfull width, and corresponding increasing width to depth ratio. Entrenchment, however, is steady. The pool to riffle ratio and residual pool depth is also steadily increasing, and substrate particles decreasing in size, all of which point to some changes taking place that warrant continued monitoring. The slope was the same from 2001 to 2003, and perhaps the change from 1999 is due to a survey error (this is the first site that is surveyed each year). There was a general improvement in temperatures (i.e. cooling) from 2001 to 2003, as expected with the increased flows. Greenhorn temperatures are marginally good for trout, and water quality at this site was low in nutrients. No metal concentrations were above water quality standards, or particularly noteworthy. Bacteria could be a concern, with this site tied with the neighboring Spanish abv Greenhorn site for the 3<sup>rd</sup> highest concentration of fecal coliform in 2003. Random turbidity monitoring showed an expected increase in turbidity from just above American Valley to this site at the mouth. Fish productivity followed the flow trend, increasing in productivity from 2001 to 2003.

Average pooltail fines were 31, 33, and 6%, respectively in each of the three years. Pooltail fines below 10% are preferable for trout spawning, and the 2003 measurement shows a dramatic improvement. Measurements have not been taken since 2003, but are planned for 2011. More frequent storm-related turbidity sampling has occurred since 2002, involving numerous volunteers. Results from this anecdotal sampling effort indicate that average turbidity increases in Greenhorn Creek through American Valley by over 100%, as measured over a variety of flows. At approximately bankfull or higher flows, the average increase in turbidity is 150%.

Two storm-related in-depth water quality sampling efforts were conducted in spring 2010 along Greenhorn Creek from the upper crossing under Hwy 70, to the mouth. The purpose of the sampling was to try and identify potential water quality-related limiting factors for the trout population in Greenhorn Creek. Results of the sampling showed that Greenhorn Creek was within water quality standards, except for one high aluminum reading at the uppermost site. It was determined that the resources were not currently available to conduct a more thorough sampling effort (i.e. more sampling points, and more samples



collected during more storm events), but it does appear from these two measurements that water quality from storm-generated run-off is not a limiting factor for trout production in Greenhorn Creek.

In 2007 and 2008, several landowners approached the FR-CRM with concerns over bank erosion. In response, the CRM contacted all of the landowners along Greenhorn Creek, who supported the development of a comprehensive plan to address bank erosion along the channel. The analysis area was determined, and the CRM sought and was awarded planning funds from Title III of the Secure Rural Schools and Self-Determination Act to assess the potential for restoration. The following is excerpted from the final report from that effort (Plumas Corporation 2009):

The segment of Greenhorn Creek running through American Valley provides irrigation water to six livestock and hay producers. Within the survey area there are three irrigation diversion dams along the channel, one at Highway 70, one mid-valley at the Shea Ranch, and one at the upper end of the Bresciani Ranch. There are also five road crossings. These dams and road crossings have, and continue to, exert considerable influence on channel dynamics. The channel has also been manipulated in several sections.

At present, the irrigation dams act to hold the bed at a pre-degradation elevation. However, while they have a significant stabilizing force on upstream segments of the channel, they are also now impassable to fish, due to the downcut streambed below each dam. All three dams are fairly old and the upper two are in danger of collapse. A dam collapse would cause major channel adjustment, with deposition below each dam, and head-cutting in the upstream direction. The elevation drop is 7.4 feet at Highway 70 and 9.0 feet at the Shea dam. The drop at the Bresciani dam is 1.5 feet.

The road crossings constrict high flows, creating backwater effects, which induce bedload deposition (bar formation) upstream. Consequently, bank erosion opposite of these developing bars accelerates as the gully widens to accommodate the developing meanders.

Historic channel straightening activities have contributed to the existing down-cut condition. Some of these straightened sections of channel now have some of the most locally stable banks along Greenhorn Creek. This temporary situation has led to the common, but erroneous, conclusion that straightening a channel leads to stability. In fact, most straightened channels eventually require stabilization work. In Greenhorn Creek, channel straightening has led to down-cutting, and attendant subsequent adjustments such as widening to accommodate the slope, bedload transport and floodplain that are all necessarily parts of what we call a "stream channel.

Relatively strong riparian vegetation and very cohesive soils have allowed many banks to re-vegetate since the last significant flood event. The recent drought has also allowed vegetation to propagate and thrive without the undue stress of frequent high flows. This stabilizing trend is likely to continue until the next big event. At that time, the recovery/revegetation process will be truncated as more bedload enters the system, and the gully widens at any weak point to accommodate both the bedload and the flood waters. Then the recovery/revegetation process would re-start.

Water temperatures were successfully measured in Greenhorn Creek above American Valley, at the Massack gage, and at the mouth of Greenhorn Creek, above its confluence with Spanish Creek in 2009. In general, water temperature increases approximately 9°F as Greenhorn Creek flows through American Valley. In 2009, there was a nine degree increase in daily average, daily maximum, and weekly average water temperatures. Diurnal fluctuation was approximately the same at both stations.

The warming of water traveling through American Valley can have an influence on trout production. At Massack, above the valley, the daily average temperature did not exceed 68°F, whereas 32 days at the confluence had an average temperature above 68°F. About 29% of the time from mid-May to the beginning of September, the temperature was above 68°F at the mouth. Temperatures above 68°F are not conducive for trout production. Short term temperatures above 75°F can be lethal. At Massack, there were 0 hours with temperatures above 68°F, and 3 hours with temperatures above 75°F at the mouth. Temperatures appear to be conducive for trout in some places through American Valley, and not in others. Continued monitoring should help narrow the sources of warming water temperatures through American Valley; however, lack of shade along sections of channel with eroding banks, and shallow areas associated with recently deposited gravel are likely sources of warming.

In 2007 and 2008, 39 channel and valley-wide cross-sections, and a longitudinal profile were topographically surveyed. Cross-section graphical displays and locations can be found in the report excerpted above. Table 5 displays gully and channel characteristics.

The following table displays flow frequency estimations, based on calculations using the slope-area method, and least squares at Hwy 70, then extrapolated downstream to the middle of the project area, with a 152% greater watershed area.

**Table 6. Flow frequency estimations for the middle of the project area.**

Return Interval (years)	Estimated Flow (ft <sup>3</sup> /second)
1.5 ("bankfull")	760
2	1,064
5	2,736
10	4,256
25	6,688
50	9,120
100	10,640

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### Impact Discussion:

Project construction activities would be required to comply with water quality standards. See mitigations under Soils and Geology. In the long term, the project is expected to improve water quality by reducing sedimentation and water temperatures. As a bank stabilization and fish passage project, there would be no effect on groundwater supplies or recharge, nor run-off, nor flood water elevations. The project would slightly alter the flow vectors away from the eroding bank and into the center of the channel using boulder vanes. This is expected to reduce on-going erosion, but would not significantly impede the passage of floodwaters within the channel.

The following discussion is excerpted from the environmental analysis for the Reid/PNF Treatment Unit Environmental Analysis: Potential impacts of the project on water resources include: sedimentation, water temperature, and channel geometry. Effects on **sedimentation** include a potential short term increase due to construction. Such direct negative impacts would be minimized by following mitigation measures described under the Soils and Geology section of this document. Sedimentation is expected to be directly reduced in the long term by the project because eroding gully walls would no longer contribute excessive sediment. In turn, by removing gully wall recession as a source of excessive fine sediments and gravels, the project would indirectly help stabilize **channel geometry** by reducing the rate at which gravel is deposited on bars. Excessive deposition on gravel bars can lead to erosion of the opposite bank, as is now occurring in the project areas. The project would directly affect channel geometry with the installation of the boulder vanes that would result in pool habitat where there is now relatively shallow run

or riffle habitat. The project is expected to indirectly decrease **water temperatures** over time as shading vegetation from plantings on the treated banks mature to shade-producing size.

**Mitigation Measures:**

Some of the mitigations to protect soils also protect water quality. To further minimize hydrology and water quality impacts to a less than significant level, the following mitigation measures are required:

**Mitigation Measure 9A.** Pump water that subsurfaces into the work areas onto vegetated floodplain so that it can filter through vegetation before re-entering the stream channel.

**Mitigation Measure 9B.** Deploy sedimats® below the work areas in the channel to capture settleable solids that may enter the stream channel.

**Mitigation Measure 9C.** Service and re-fuel equipment outside of riparian areas to prevent harmful materials from being washed into the water.

**Mitigation Measure 9D.** Control Construction in Streamside Management Zones by keeping an effective vegetative filter for sediment generated by erosion from road fills, dust drift and oil traces; maintain existing shade, riparian habitat and channel stabilizing vegetation as much as possible. Maintain as much of the floodplain surface as possible in a resistant, undisturbed condition to limit erosion by flood flows.

**Mitigation Measure 9E.** Minimize stream channel disturbances and related sediment production as much as possible.

**Mitigation Measure 9F.** Collect water quality samples and document water quality data.

**10. LAND USE AND PLANNING**

**Environmental Setting:** The project area is located primarily on both private land, but does include one acre of National Forest land (within the Reid/PNF treatment area). The primary land use within the project area is cattle grazing, with some low density housing. Most of the stream channel, including the one acre of National Forest within the Reid/PNF Treatment Unit, is fenced to exclude cattle grazing along the stream banks. Of the 20 acres of private lands within the treatment units, seven acres are open to managed horse or cattle grazing.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** Project construction is confined to the gullied stream channel, and would not alter any existing land uses. The project complies with zoning and plan designations as documented in the Plumas County General Plan. The project implements standards and guideline and general direction, as documented in the 1988 Plumas National Forest Land and Resource Management Plan as amended by the Herger-Feinstein Quincy Library Group 1999 Final EIS and Record of Decision, the 2003 HFQLG Supplemental EIS and Record of Decision, and the 2004 Sierra Nevada Forest Plan Amendment supplemental EIS and Record of Decision. There are no other known plans for the project area.

**Mitigation Measures:** No mitigation required.

## 11. MINERAL RESOURCES

**Environmental Setting:** There are no known mineral resources in, or near, the project area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** There are no known mineral resources, and there would be no impact on mineral resources in, or near, the project area.

**Mitigation Measures:** None required.

## 12. NOISE

**Environmental Setting:** The project is within an open meadow with cattle grazing and low density

housing. One house is less than 300 feet from project activity, however, the resident of the house requested that the project address erosion near her property. There are no airstrips near the project area. There are no existing sources of noise in, or near, the project area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project result in:				
a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** Project construction activities would involve heavy equipment, which can produce noise levels as high as approximately 90 decibels. Construction may last as long as 10 weeks. Once construction is completed, the area will revert to its natural state, with no sources of noise.

**Mitigation Measures:** None required.

### 13. POPULATION AND HOUSING

**Environmental Setting:** The area includes low density housing.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** This restoration project would not affect population or housing in any way.

**Mitigation Measures:** None required.

#### 14. PUBLIC SERVICES

**Environmental Setting:** For the existing low density housing, there is one fire station on Chandler Road, outside of the project analysis area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The restoration project would not affect populations or public services.  
**Mitigation Measures:** None required.

## 15. RECREATION

**Environmental Setting:** The project is located primarily on private land, with agricultural land use. Fishing within the stream corridor is the primary recreational use in the area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project does not include recreational facilities, nor would it lead to a need for recreational facilities. The project is not expected to increase recreational use within the area. The fish passage and improved fish habitat is expected to increase fish populations, not only within the project area, but also upstream and downstream of American Valley. This is expected to improve fishing success, but is not expected to lead to the need for recreational facilities.

**Mitigation Measures:** None required.

## 16. TRANSPORTATION/TRAFFIC

**Environmental Setting:** Two of the project areas are accessible by Highway 70, which is a major two-land highway, with a maximum speed of 50 mph in the project area. Three of the project areas are accessible along Chandler Road, which is a two-lane road (no center line) with a maximum speed of 25 mph. One project area is accessible by Quincy Junction Road, another two-land road with a maximum speed of 45 mph.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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Would the project:



	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** This is a restoration project that would impact the stream channel within the meadow. There would be no long term effects on transportation or traffic. In the short term, the project would involve the transportation of materials to the treatment areas, with an estimated 406 trips of 20 cubic yard end dumps. Where the project is located near Highway 70, both right and left turns would occur off of the Highway. There are wide shoulders on both sides of the highway at this location which will enable trucks to pull off the highway to the right if traffic is too heavy for a safe left turn. **Mitigation** includes signage on the highway in both directions warning motorists of trucks entering and leaving the highway. On Chandler and Quincy Junction roads, signage would also be used.

**Mitigation Measures:**

The following mitigation measures will be implemented to ensure traffic safety:

**Mitigation Measure 16A.** Plumas Corporation shall obtain an encroachment permit from Caltrans for Highway 70 traffic and from Plumas County for county road traffic prior to beginning construction.

**Mitigation Measure 16B.** Warning signs shall be placed in both directions on all roads with truck traffic associated with the project in compliance with the encroachment permits.

## 17. UTILITIES AND SERVICE SYSTEMS

**Environmental Setting:** There are power and phone lines near the project areas. Residences in the analysis area use individual septic systems for wastewater treatment.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project would stabilize streambanks and improve fish passage in the stream channel. Project activities would not affect any utilities in any way.

**Mitigation Measures:** None required.

## 18. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project would stabilize eroding stream banks and improve fish passage on Greenhorn Creek in American Valley. There would be no adverse direct or indirect effects on humans. Implementation of the project would improve the quality of the environment, as discussed above under sections: 2. Agricultural Resources; 4. Biological Resources; 6. Soils and Geology; and 9. Hydrology and Water Quality. In the short term, however, project construction would involve ground disturbance. Best management practices, standard operating procedures, and project-specific mitigation measures enumerated in this initial study would ensure that resources are protected, and that there would be no significant negative impacts during the construction phase of the project.

Project activities would affect 21 acres within a 404-acre analysis area in American Valley. The improvements that would result from the project are expected to complement previously completed projects in Greenhorn Creek. Bank stabilization has been an on-going concern of landowners along Greenhorn Creek, especially since down-cutting began in earnest with the flood of 1955. Soon after that flood, landowners used cars to stabilize stream banks. In 1991, one of the earliest projects of the Feather River CRM was to stabilize 0.75 miles of streambank both above and below Highway 70, using log revetments and meander re-alignment. Another follow-up stabilization project was implemented in 2001 above Highway 70 using boulder vanes. The Integrated Greenhorn Creek Restoration Project includes extending the 2001 boulder vane work downstream another 150 feet.

Project construction is planned to begin in the late summer or early fall of 2011 on the Reid/PNF Treatment Unit. Implementation of the other treatment areas is pending implementation funding, but could occur as early as summer 2012.

**References:**

Durrell, C. 1987. Geologic History of the Feather River Country, California. University of California Press. Berkley, CA

Powers, R.F., D.A. Scott, F.G. Sanchez, R. A. Voldseth, D. Page-Dumroese, J.D. Eliooff, D.M. Stone. 2005. The North American long-term soil productivity experiment: findings from the first decade of research. Forest Ecology and Management 220 (2005) 31-50.

# **Biological Assessment and Biological Evaluation**

**For**

## **Integrated Greenhorn Creek Restoration Project**

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**March 23, 2011**

## **INTRODUCTION**

The purpose of this Biological Assessment (BA)/Biological Evaluation (BE) is to review the proposed project in sufficient detail to determine its effect on species of concern. Specifically, BE's are completed to determine whether a proposed action will result in a trend toward a Forest Service sensitive species becoming Federally listed. BA's are completed to document effect on proposed, threatened or endangered species, and/or critical habitat; and to determine whether formal consultation or conference with U.S. Fish and Wildlife Service (USFWS) or CA Dept. of Fish & Game (CDFG) is required. The most current list of Threatened, Endangered and Sensitive (TES) were queried within the California Natural Diversity Database (CNDDDB) and US Fish and Wildlife Service's most current TES species lists (Table 1). This Biological Assessment conforms with legal requirements set forth under Section 7 of the Endangered Species Act and standards established in Forest Service Manual direction (FSM 2672.42) for projects on Plumas National Forest (PNF) land.

The Greenhorn Creek Integrated Restoration (GCIR) project is located in the American Valley Quincy, CA, in Plumas County along Greenhorn Creek, Sections 16, 17, 8, 7 of Township 24N/Range 10E. The watercourse moves east to west through the wide-spanning valley and eventually joins with Spanish Creek at the northwest end of the valley.

**TABLE 1: Threatened, Endangered, Proposed and Sensitive Animal Species that Potentially Occur on the Plumas National Forest, as of April 29, 2010.**

Species	Category
<b><u>INVERTEBRATES</u></b>	
Valley elderberry longhorn beetle ( <i>Desmocerus californicus dimorphus</i> )	Threatened
<b><u>FISH</u></b>	
Hardhead minnow ( <i>Mylopharodon conocephalus</i> )	Sensitive
<b><u>AMPHIBIANS</u></b>	
California red-legged frog ( <i>Rana aurora draytonii</i> )	Threatened
Foothill yellow-legged frog ( <i>Rana boylei</i> )	Sensitive
Mountain yellow-legged frog ( <i>Rana muscosa</i> )*	Candidate/Sensitive
Northern leopard frog ( <i>Rana pipiens</i> )	Sensitive
<b><u>REPTILES</u></b>	
Pacific pond turtle ( <i>Actinemys marmorata marmorata</i> )	Sensitive
<b><u>BIRDS</u></b>	
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Sensitive
Northern Goshawk ( <i>Accipiter gentiles</i> )	Sensitive
California spotted owl ( <i>Strix occidentalis occidentalis</i> )	Sensitive
Great gray owl ( <i>Strix nebulosa</i> )	Sensitive
Willow flycatcher ( <i>Empidonax trailii brewsteri</i> )	Sensitive
Greater sandhill crane ( <i>Grus canadensis tabida</i> )	Sensitive
Swainson's hawk ( <i>Buteo swainsoni</i> )	Sensitive
<b><u>MAMMALS</u></b>	
Sierra Nevada red fox ( <i>Vulpes vulpes necator</i> )	Sensitive
American marten ( <i>Martes americana</i> )	Sensitive
Pacific fisher ( <i>Martes pennant pacifica</i> )	Candidate
California wolverine ( <i>Gulo gulo luteus</i> )**	Sensitive/Candidate
Pallid bat ( <i>Antrozous pallidus</i> )	Sensitive
Western red bat ( <i>Lasiurus blossevillii</i> )	Sensitive
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	Sensitive

\* discussed in this report as Sierra Nevada yellow-legged frog

\*\*As of December 24, 2010, California wolverine is a candidate species.

Several T&E species identified in the list of T&E species provided by the "Federal Endangered and Threatened Species that may be affected by Projects in the Plumas National Forest", updated April 29, 2010, accessed via USFWS web page

([http://www.fws.gov/sacramento/es/spp\\_lists/NFActionPage.cfm](http://www.fws.gov/sacramento/es/spp_lists/NFActionPage.cfm)) (Appendix A), have been eliminated from further analysis, based on past analysis and concurrence from the USFWS (HFQLG BA/BE Rotta 1999, USFWS letter 1-1-99-I-1804 dated August 17, 1999) or due to lack of species distribution and/or lack of designated critical habitat. These species are listed below:

- Winter Run Chinook Salmon (*Oncorhynchus tshawytscha*)

- Conservancy Fairy Shrimp (*Branchinecta conservatio*)
- Central Valley steelhead (*Oncorhynchus mykiss*)
- Delta Smelt (*Hypomesus transpacificus*)
- Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)
- Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*)
- Carson wandering skipper (*Pseudocopaeodes eunus obscurus*)
- Critical Habitat for vernal pool invertebrates (Butte County)
- Critical habitat for California red-legged frog

In addition, there is no known habitat, have been no observations, and the Integrated Greenhorn Creek Restoration Project Wildlife Analysis Area is above the elevational range for the valley elderberry longhorn beetle, a threatened species. Therefore, this species will not be discussed further in this document. There is also no suitable habitat and have been no observations of the following sensitive species in, or near, the Integrated Greenhorn Creek Restoration Project Wildlife Analysis Area: hardhead minnow, northern leopard frog, Swainson's hawk, and all sensitive forest carnivores (Sierra Nevada red fox, American marten, Pacific fisher, California wolverine). Therefore, these seven species will not be discussed further in this document. Sensitive carnivores also are not likely to occupy habitat with as much residential and agricultural activity as occurs in, and around, the analysis area.

The closest known population of California red-legged frogs to the project area is over 30 air miles southwest of the project area, in a drainage that is directly tributary to the pool of Lake Oroville. It would be nearly impossible for this closest known population to get close to colonizing the project area, with numerous reservoirs, and over 80 stream miles between this population and the project area. The nearest critical habitat is located at approximately 2,200 foot elevation, also over 30 air miles from the project area. Abundant surveys have been conducted throughout the Plumas National Forest over the past 15 years, with no new populations found, nor is any critical habitat located within Plumas County. No CARLF individuals were found during project-specific surveys for the Integrated Greenhorn Creek Restoration Project. Therefore this species would not be affected by the Proposed Action, and will not be discussed further.

At the end of this document, Table 5 displays the Wildlife BA/BE determinations for the remaining species listed in Table 1. These species are discussed further below.

### **CONSULTATION TO DATE**

From February 10, to August 3, 1999, a series of informal meetings and written correspondence occurred between the USDA Forest Service and USFWS regarding the development of the HFQLG FEIS (See programmatic Biological Assessment and Evaluation of Herger-Feinstein Quincy Library Group Forest Recovery Act (Rotta 1999) pg 5, for specific topics discussed and timelines). As a result, the Forest



Service incorporated the recommended measures provided by USFWS for the bald eagle and California red-legged frog (USFWS 1999).

No consultation specific to the Integrated Greenhorn Creek Restoration Project was done. A list of T&E species was provided by the "Federal Endangered and Threatened Species that may be affected by Projects on the Plumas National Forest", updated April 29, 2010, accessed via USFWS county list web page ([http://www.fws.gov/sacramento/es/spp\\_lists/NFActionPage.cfm](http://www.fws.gov/sacramento/es/spp_lists/NFActionPage.cfm)) (Appendix A). On March 4, 2011 the Proposed Action was sent via email to Terri Weist and Amber Rossi of the California Department of Fish & Game. No issues were raised and no correspondence has occurred since with regard to the Integrated Greenhorn Creek Restoration Project. NEED TO WAIT TIL END OF SCOPING TO FINALIZE THIS

### **CURRENT MANAGEMENT DIRECTION**

The proposed project is both on private land within the boundaries of the Plumas National Forest, and on Plumas National Forest lands. Current management direction on private lands within the state of California, Plumas County can be found in the following documents:

- California Environmental Quality Act (CEQA; 1970)
- California Endangered Species Act
- Plumas County General Plan

Current management direction for threatened, endangered, proposed and sensitive species on the PNF can be found in the following documents:

- Code of Federal Regulations (23, 36, 50 CFR)
- Forest Service Manual and Handbooks (FSM/H 1200, 1500, 1700, 2600)
- Endangered Species Act (ESA 1976)
- National Environmental Policy Act (NEPA 1969)
- National Forest Management Act (NFMA 1976)
- Plumas National Forest Land and Resource Management Plan (PNF LRMP 1988)
- Regional Forester (Region 5) policy and management direction
- Regional Forester (Region 5) Sensitive Plant and Animal Species List (June 10, 1998), as appended October 15, 2007
- USFWS Quarterly Species List (updates through January 15, 2009)
- Herger-Feinstein Quincy Library Group Forest Recovery Act (HFQLGFRA) and its implementing Final Environmental Impact Statement (FEIS), Record of Decision (ROD), August 1999

- Sierra Nevada Forest Plan Amendment (SNFPA) and its implementing Final Environmental Impact Statement (FEIS), Record of Decision (ROD), January 2001
- Herger-Feinstein Quincy Library Group Forest Recovery Act (HFQLGFRA) and its implementing Final Supplemental Environmental Impact Statement (FSEIS), Record of Decision (ROD), July 2003
- Sierra Nevada Forest Plan Amendment (SNFPA) and its implementing Final Supplemental Environmental Impact Statement (FSEIS), Record of Decision (ROD), January 2004
- HFQLG/SNFPA Implementation Consistency Crosswalk Update 11/08/2007
- Sierra Nevada Forests Management Indicator Species Amendment FEIS, December 2007
- Bald and Golden Eagle Protection Act of 1940, as amended
- The Migratory Bird Treaty Act of 1918, as amended

Forest Service direction for TES species incorporated in this BA/BE can be found in the Forest Service Manual (FSM 2670.31, FSM 2670.32). Information regarding threatened, endangered, proposed and sensitive animals is also obtained through the cooperation of the USFWS and the CDFG.

The Plumas National Forest Land and Resource Management Plan (PNF LRMP) provides Forest specific information on how TES species will be managed. These include forest wide goals and policies for Wildlife, Fish and Sensitive Plants (p. 4-4) and Riparian Areas (p. 4-7), Wildlife objectives (p. 4-14, 4-15, and 4-19), forest wide direction and standards and guidelines for Wildlife, Fish and Sensitive Plants (p. 4-29 through 4-32). Management Area specific and species-specific direction and prescriptions will be included in the species discussions below. Direction is also found under other areas (e.g., Timber management) that directly or indirectly affect animal species and/or their habitats. This direction is incorporated by reference. The PNF LRMP provides management guidelines that incorporate Regional direction for each species. Current TES and wildlife direction can be found in the PNF LRMP, as amended by the HFQLGFRA FEIS, as amended by SNFPA FSEIS ROD (2004), for Wildlife, Fish, Riparian Ecosystems and riparian-dependent wildlife species. As per the May 10, 2004 letter (and attachments) from the three Forest Supervisors within the HFQLG pilot project area, the 2004 SNFPA ROD replaced the 2001 SNFPA ROD in its entirety and the 2001 ROD, or the 2001 Appendix A should not be used. Attachments to this May 10 letter provide consistent guidance for applying 2004 SNFPA ROD and FSEIS and the HFQLGFRA FEIS.

### **DESCRIPTION OF PROPOSED PROJECT**

Greenhorn Creek is the primary water course through American Valley, and has been used as an important resource for both Euro-American settlers and Native Americans before them. Through recent history, existing uses and property boundaries have taken a toll on the ability of the system to ecologically absorb perturbations. The proposed treatments consider existing land uses, constraints, and channel dynamics, including bedload movement through the Greenhorn Creek system. The two fish passage structures, at

the Shea Dam and Highway 70 irrigation dam (treatments 2 and 5, listed below) would protect the dams from further erosion damage, and stabilize the channel bed and banks. Implementation at any of the treatment sites is not dependent upon implementation at any other site. The following list includes all Greenhorn Integrated Restoration Project treatments considered under this analysis. However it is only treatment number 4, the Reid/PNF treatment unit that is subject to a decision by the Mt Hough District Ranger, as that is the only site that include National Forest System lands. All other treatment sites are located entirely on private land, and will be environmentally reviewed under the California Environmental Quality Act process. The treatments on private lands are analyzed in this document as cumulative effects from reasonable foreseeable future action.

1. Above and below Quincy Junction Rd, boulder vanes would be installed on 1,800 feet of actively eroding banks for stabilization. Access into the APE would be from the Quincy Junction onto an existing ranch access route.
2. At the Shea Dam, 3,000 cubic yards of 4'-minus pit material would be used to create a 200'-long, fish passable riffle-pool structure. Access into the APE would be from the existing gravel driveway, which was constructed of imported fill.
3. At the Carol Lane East Bridge, boulder vanes would be installed along a 240 feet section of channel to stabilize the channel bed and bank. Access into the APE would be on the existing paved road.
4. At the Plumas National Forest/Reid bank, boulder vanes would be installed along a 390-foot section of actively eroding bank. Access into the APE from the paved road would be via an existing dirt ranch road, which was surveyed.
5. At the Highway 70 irrigation dam, 5,000 cubic yards of material would be used to install a 200'-long fish-passable riffle pool structure. Access from the highway would be on an existing dirt ranch road in the APE, which was surveyed.
6. On the Farnworth property, boulder vanes would be installed along a 220 foot section of actively eroding bank. Access from the highway would be on an existing dirt ranch road in the APE, which was surveyed.

Project equipment would include an excavator, a front end loader, and two dump trucks, which would access the treatment units on existing paved roads, one gravel driveway, and three dirt roads.

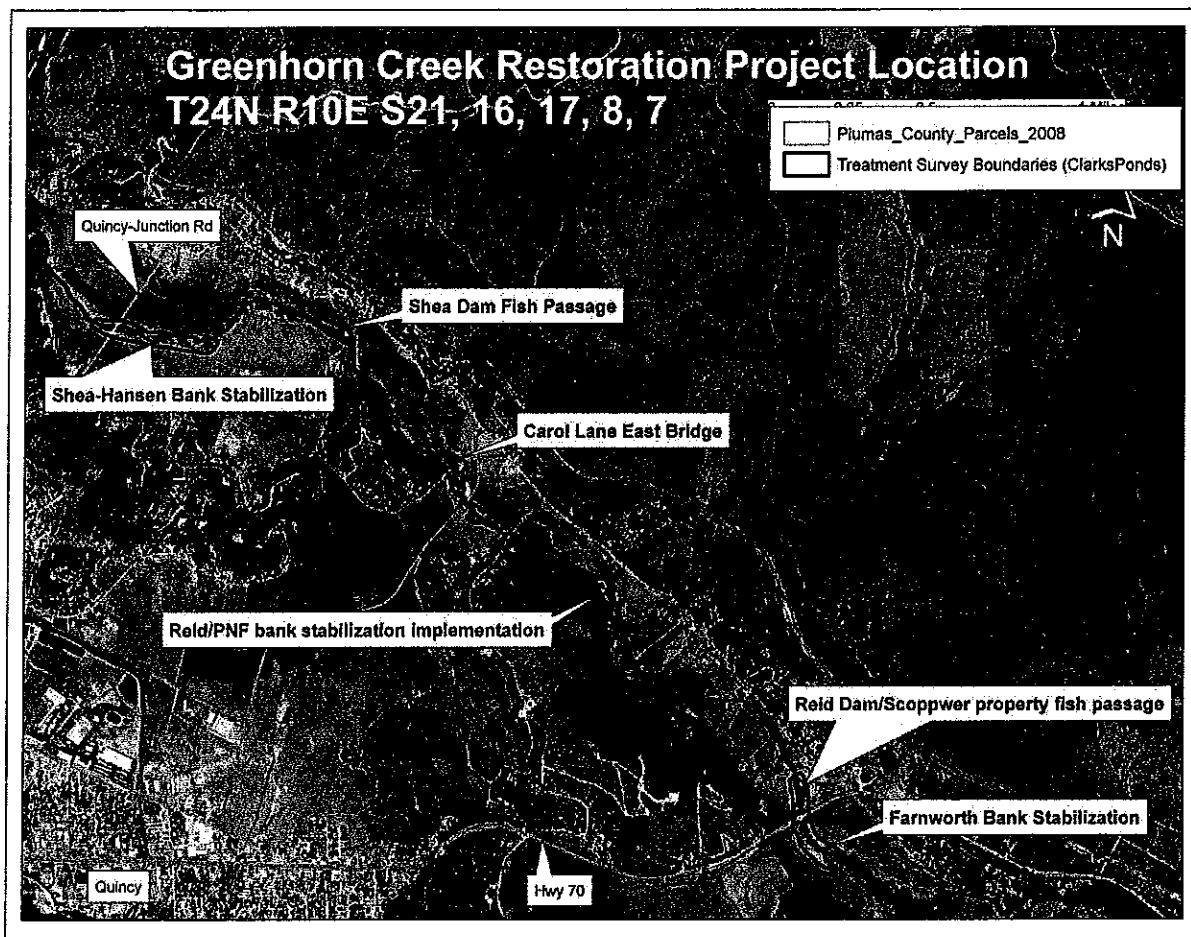


Figure 1. Location of six treatment areas.

## SCOPE OF ANALYSIS

### **Geographic Analysis Areas**

The six treatment areas comprise 21.3 acres and 1.3 miles of stream channel within American Valley along Greenhorn Creek. For the purpose of this BA/BE, the Wildlife Analysis Area is defined as this entire portion of American Valley. The wildlife cumulative effects analysis boundary area encompasses 404 acres of both National Forest System (1 acre) and private (403 acres) lands (Figure 2), along 3.9 miles of Greenhorn Creek. This area was chosen for the cumulative effects analysis because it comprises an area similar to those habitats in the project area, i.e. gullied stream channel in an agricultural meadow with dispersed housing. This Wildlife Analysis Area is being used for all wildlife species analyzed in this BA/BE because effects of the project would not extend beyond the Wildlife Analysis Area boundary. The direct and indirect effects of each alternative, together with the additive or cumulative effects of each alternative, have been considered in evaluating impacts to TES species and TES habitat. Only the actual project area treatment polygons were field surveyed.

### **Timeframe for Analysis**

The timeframe used for determining cumulative effects depends on the length of time that lingering effects of the past actions would continue to impact the species in question. For the Integrated Greenhorn Creek Restoration Project, general information based on the history of the area and site specific information based on available data, going back approximately 20 years and forward approximately five years was incorporated.

### **Analysis Methodology**

The Integrated Greenhorn Creek Restoration Project was reviewed for wildlife resources using digital orthophoto quadrangles (DOQs), species specific spatial datasets, and known information to help determine suitable habitat for TES species. The U.S. Forest Service, Mount Hough Ranger District and the California Natural Diversity Database (CNDDB) were consulted for records of special-status wildlife species that potentially occur in the vicinity of the project area. Areas identified as suitable habitat were field surveyed to the following R5 protocols and acceptable standards: "Standardized protocol for Surveying Aquatic Amphibians" (Fellers and Freel 1995); and "A Willow Flycatcher Survey Protocol for California, May 29, 2003" (Bombay, et al. 2003). Surveys for amphibians and willow flycatcher were conducted by Brian Shaw of Klamath Wildlife Resources. Surveys were completed for amphibians on July 28, 2010 with no target species discovered. Willow flycatcher surveys were completed on June 22 and July 7 in appropriate habitat with none found. For the analysis of effects, changes to suitable habitat were determined by using a spatial dataset of the existing habitat compared to expected changes induced by the project.

## Integrated Greenhorn Creek Restoration Project Cumulative Effects Analysis Area

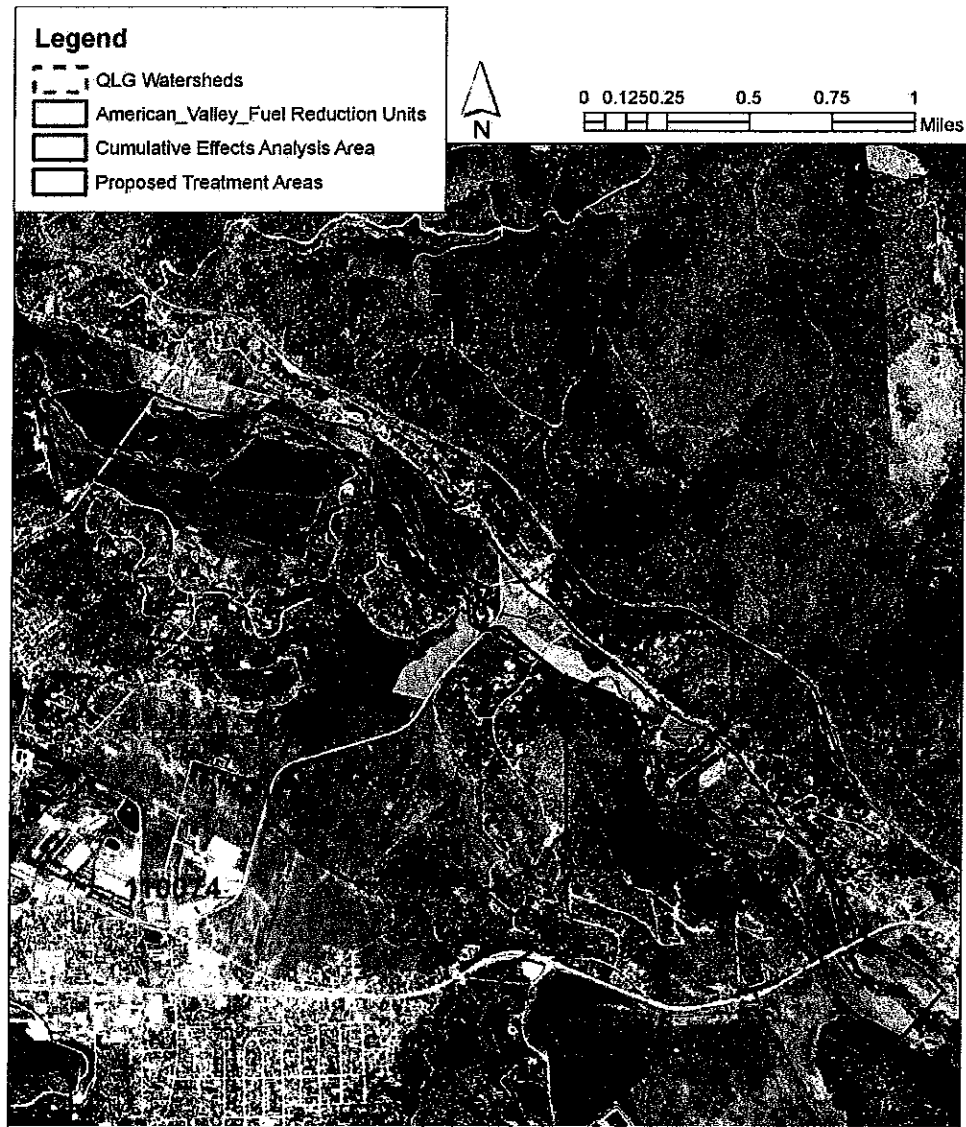


Figure 2. Wildlife Cumulative Effects Analysis Area.

## **AFFECTED ENVIRONMENT**

The following table displays existing habitat types in the Reid/PNF Treatment Unit, the other proposed Treatment Units on private land, and total wildlife cumulative effects analysis area.

**Table 2. Existing California Wildlife Habitat Relationships habitat type acreages in the project area and wildlife analysis area.**

<b>CWHR Habitat type</b>	<b>Reid/PNF Treatment Unit</b>	<b>All Treatment Units</b>	<b>Total Wildlife Analysis Area<sup>4</sup></b>
Riverine <sup>1</sup>	0.7	8.8	29.8
Montane Riparian <sup>2</sup>	0	1.5	17.6
Pasture <sup>3</sup>	0.5	11	316
Wet Meadow	0	0	32.8
Lacustrine	0	0	1.2
Non-wildlife habitat <sup>5</sup>	0	0	6.6
<b>TOTAL</b>	<b>1.2</b>	<b>21.3</b>	<b>404</b>

<sup>1</sup> acreage based ordinary high water mark

<sup>2</sup> acreage based on established vegetation within the gully bottom

<sup>3</sup> terrace above the gully bottom

<sup>4</sup> total includes project areas

<sup>5</sup> roads and buildings

### **Riverine Habitat**

Riverine habitat was identified as areas within the bottom of the gully within the ordinary high water mark. Backwater areas formed by irrigation dams on Greenhorn Creek were included in riverine habitat. Riverine channels within the analysis area have degraded to an average of seven feet below the elevation of the meadow. The entrenchment of the channel has resulted in diminished riverine habitat acres that are confined to the bottom of the gully. The current condition of excessive channel erosion from entrenchment widening and deepening, results in riverine habitat with excessive sedimentation and decreased bank vegetation. These characteristics translate to diminished quality of habitat for aquatic life, including macroinvertebrates that are an important food source for many species discussed below.

### **Lacustrine Habitat**

There is no lacustrine habitat within any treatment unit. There is one 1.2 acre farm pond within the wildlife cumulative effects analysis area that is located on private land. This habitat would not be affected by any treatment and will not be discussed further.

### **Montane Riparian Habitat**

In the existing degraded condition, montane riparian habitat is confined to the gully. CWHR montane riparian habitat has also been further restricted, due to the poor condition and early seral stage of riparian vegetation within the gully, resulting in no montane riparian habitat in the Reid/PNF Treatment Unit; only 1.5 acres in the other treatment polygons on private land; and 17.6 acres in the rest of the wildlife cumulative effects analysis area.

### **Wet Meadow Habitat**

Wet meadows are a function of channel/floodplain hydrology and soil types. Before the advent of intensive agricultural use along Greenhorn Creek, wet meadow was likely the predominant habitat type. Meadows within the analysis area were wetter before channel degradation. The entrenched channel throughout the length of the floodplain meadow of the analysis area has greatly altered the channel/floodplain hydrology, resulting in drier meadow conditions. In the existing condition, there are 32.8 acres of wet meadow habitat in the analysis area. The entrenched channel in the analysis area dries out the meadow by creating a drain at a lower elevation (creating more drainage pressure).

### **Pasture Habitats**

Channel degradation in the analysis area has contributed to some conversion of pre-degradational wet meadow habitat into drier habitats. The predominant land use in the wildlife analysis area is agriculture. All of the wildlife analysis area outside of the entrenchment is in this category (except areas of wet meadow, pond or non-habitat areas). In the existing condition, there are 316 acres of pasture habitat.

## **ENVIRONMENTAL CONSEQUENCES - GENERAL**

Table 3. California Wildlife Habitat Relationships habitat type acreages in the existing condition (No Action) compared to expected acreages under the Proposed Action.

<b>CWHR Habitat type</b>	<b>Reid/PNF Treatment Unit</b>		<b>All Treatment Units</b>		<b>Total Wildlife Analysis Area<sup>4</sup></b>	
	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
Riverine	0.7	0.7	8.8	8.8	29.8	29.8
Montane Riparian	0	0.1	1.5	1.8	17.6	17.9
Pasture	0.5	0.4	11	10.7	316	315.7
Wet Meadow	0	0	0	0	32.8	32.8
Lacustrine	0	0	0	0	1.2	1.2
Non-wildlife habitat	0	0	0	0	6.6	6.6
<b>TOTAL</b>	<b>1.2</b>	<b>1.2</b>	<b>21.3</b>	<b>21.3</b>	<b>404</b>	<b>404</b>

Implementation of the Proposed Action in the Reid/PNF Treatment Unit is expected to alter existing riverine and pasture habitat. Within the other treatment polygons, treatments would affect riverine, montane riparian and pasture habitat. Direct impacts to these habitats include: (1) temporarily routing channel flows from the existing channel into a bypass channel during construction; (2) increasing the percentage of pool (versus riffle) habitat; (3) increasing bank angle (from vertical to a 1:1 slope) so that vegetation can become established; (4) increasing riparian vegetation (sedges, willows, and alders where available) on the newly sloped banks; (5) slightly decreasing pasture habitat to improve the bank angle on



vertical banks; (6) improving water quality of riverine habitat by decreasing sedimentation from eroding banks.

Indirect effects to habitat would be due to disruption of the channel during construction, which would cause a temporary reduction (less than six months) in aquatic macro-invertebrates that are prey for amphibians, Pacific pond turtles, greater sandhill crane, willow flycatcher, pallid bat, Townsend's big-eared bat and western red bat.

### **Cumulative Effects**

In order to understand the contribution of past actions to the cumulative effects of the Proposed Action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the Proposed Action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions".

The following table lists the past, current and reasonably foreseeable future actions that are considered in the cumulative impacts analysis for this project:

Table 4. Actions considered for cumulative effects in this analysis.

Project	Date	Acreage	Comments
<b>Past Activities</b>			
Bank stabilization	1991-2001	0.75 acres	Completed in 1991; maintenance in 2001 on 0.04 acres
<b>Present &amp; On-going Activities</b>			
Empire Sale*	2010-2012	1,031 acres group selection, 4,168 acres of mechanical thinning, 380 acres of hand thin/pile /burn, and 2.75 miles of road decommissioning	
Agricultural & residential housing land use around Greenhorn Creek	On-going	404 acres	Includes the valley
<b>Reasonably Foreseeable Future Activities</b>			
American Valley Fuels Reduction Project*	2011-2012	166 acres	
Five additional treatment units of the Integrated Greenhorn Creek Restoration Project	2012	19 acres	Includes bank stabilization and fish passage

\* Both of these projects are located at least partially in the Greenhorn Creek watershed, however, the implementation of Best Management Practices renders these timber management projects much less likely to measurably and cumulatively impact the Integrated Greenhorn Creek Restoration Project area than the other activities listed above. These two timber management activities will not be discussed further in this document.

Past bank stabilization work contributes to the existing condition and will not be discussed further in this document. Most of the cumulative effects of agriculture on habitat are due to historic manipulations rather than on-going uses. On-going agricultural land use in the analysis area includes irrigation, haying and livestock grazing. Cattle do not graze in most treatment unit boundaries, however, some grazing does occur on the Farnworth property, and some on the Reid property at the Shea Dam fish passage treatment. Grazing is excluded from the Reid/PNF Treatment Unit. Therefore, the Proposed Action in the Reid/PNF Treatment Unit would not affect, nor be affected by, on-going livestock grazing in the analysis area. Neither would the No Action Alternative affect, or be affected, by grazing. Haying and irrigation do not occur in the Reid/PNF Treatment Unit, and neither of these activities would be affected by either alternative.

On-going housing development along Greenhorn Creek is low-density. Housing would not be affected by either alternative. Housing contributes to the existing condition and will not be discussed further.

The Proposed Action on the Reid/PNF Treatment Unit is similar to work activities planned in five other treatment units on private land. There is a potential that construction in all six of these areas combined could affect water quality and aquatic life in Greenhorn Creek in the short term (less than 6 months). Potential cumulative effects from all proposed activities in the Integrated Greenhorn Creek Restoration Project include increased siltation during construction, and decreased aquatic macro-invertebrate production in the short term (less than 6 months). The following practices are included in the Proposed Action, and on all of the proposed treatment units to minimize these potential disturbances:

- routing stream flow around the work area, using a temporarily constructed bypass channel, and straw/plastic dams upstream and downstream of the work area
- pumping water that seeps into the work area out of the channel, and onto vegetated floodplain
- deployment of Sedimats® to capture settleable solids for removal from the channel onto bank areas. Once the work is completed, the straw/plastic dams would be removed, and the temporary bypass channel filled to original grade. Sedimats would be removed from the channel, and placed on streambanks where they would aid in stabilization.

In the long term, the expected reduction of sediment due to the Proposed Action and other treatments in the Integrated Greenhorn Creek Restoration Project is expected to benefit species that depend on macroinvertebrates as food. These benefits would also accrue to trout, and it should be noted that trout can prey upon subadult amphibians and tadpoles, as well as young turtles, thus cumulative impacts that enhance habitat for trout can degrade habitat for these species.

### **ENVIRONMENTAL CONSEQUENCES – SPECIES SPECIFIC EFFECTS**

As suggested by the Council on Environmental Quality (40 CFR 1508.28) this document is tiered to the programmatic Biological Assessment and Evaluation of Herger-Feinstein Quincy Library Group Forest Recovery Act (Rotta 1999) in order to restrict its length, and help both its preparer and readers focus on the site specific impacts of this project. Detailed life history descriptions, and discussions on the overall distributions, distributions within the pilot project area, conservation status of species, habitat requirements and life histories, can be found in (Rotta 1999). These topics will only be discussed briefly here as they apply to site-specific project effects.

#### **Summary of Direct and Indirect Effects of the Proposed Action**

Overall direct effects that would occur as a result of the Integrated Greenhorn Creek Restoration project includes modification of the existing stream bed and bank morphology at six separate areas along Greenhorn Creek (see Figure 1). Bank stabilization as described in the Proposed Action in the Reid/PNF Treatment Unit, as well as proposed bank stabilization and fish passage in the five treatment areas on private land, may have an adverse direct effect on habitat in the short-term (less than six months), but are

expected to directly, indirectly, and cumulatively improve habitat in the long term (3-5 yrs) for the following US Forest Service sensitive species: Pacific pond turtle, greater sandhill crane, willow flycatcher, bald eagle, pallid bat, Townsend's big-eared bat, and western red bat. Project-specific surveys did not find any occurrence of these species.

Overall indirect effects on wildlife that could occur as a result of the project would be due to the temporary (less than six months) loss of aquatic macroinvertebrates, resulting from construction. This is an important food source for Pacific pond turtles, sandhill cranes, willow flycatchers and bats. However, only 1.3 miles to be treated of a total 3.9 miles, (or 33%) of the channel in the analysis area would be affected by construction over a period of at least two years. Therefore, in the wildlife analysis area, macroinvertebrate populations are not expected to temporarily decline to a level that would impair species that depend upon this food source. In the long term (3-5 years), the reduced sedimentation that is an expected result of the project would improve habitat for macroinvertebrates and the species that depend on them as a food source.

#### **Summary of Cumulative Effects of the Proposed Action**

Table 4 describes activities considered in the cumulative effects analysis for the Integrated Greenhorn Creek Restoration Project. A cumulative watershed effects (CWE) analysis that was completed for the Empire fuel reduction project yielded 10.2% ERA (equivalent roaded acres), which is 85% of the Threshold of Concern (TOC) for the Greenhorn Creek watershed. Most (>75%) of the impacts however, are attributed to private land timber harvest. The Empire and American Valley projects are expected to produce long term benefits for soil productivity and watershed values by reducing the vulnerability of the project areas to high intensity wildfires that have adverse effects on these resources. These watershed benefits would be enhanced by the Proposed Action and other actions in the Integrated Greenhorn Creek Restoration Project that are expected to reduce sediment produced from eroding stream banks.

Cumulative effects to habitat in the analysis area due to agriculture are primarily due to historic manipulations rather than on-going uses. However, any cumulative effects to habitat due to agriculture would be reduced by implementation of the Proposed Action because eroding stream banks would be stabilized. Cumulative effects from other bank stabilization projects would be detrimentally additive in the short term, with increased short-term sedimentation during construction from implementation of all six treatment units, however, implementation of erosion and sedimentation control actions listed above would greatly reduce this impact. In the long term, treatments on private land would add to the reduction in sediment that would occur under the Proposed Action in the Reid/PNF treatment unit. It is expected that the treatment in all six units could result in a measurable reduction of sediment in Greenhorn Creek. It is doubtful that the reduction in sediment from just the Proposed Action in the Reid/PNF unit would be measurable.

#### **Summary of Direct, Indirect, and Cumulative Effects of the No Action Alternative**

The No Action Alternative would result in no direct change in current conditions and trends within the analysis area. The opportunity to improve riparian and aquatic habitats for wildlife species will not occur at this time. Gullied stream banks will continue to erode, resulting in the continued loss in the quality and quantity of riparian and aquatic habitats. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from reasonably foreseeable treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

#### **SIERRA NEVADA YELLOW-LEGGED FROG (SNYF) (*Rana sierrae*)**

SNYF is a candidate for federal listing. SNYF can be found in meadow streams, isolated pools, and lake borders, and prefer sloping banks with rocks or vegetation to the water's edge. They are usually not found more than 2-3 jumps from water (Stebbins 1985). Historically, *Rana sierrae* ranged "...from the Diamond Mountains north-east of the Sierra Nevada in Plumas County, California, south through the Sierra Nevada to the type locality, the southern-most locality (Inyo County). In the extreme north-west region of the Sierra Nevada, several populations occur just north of the Feather River, and to the east, there was a population on Mt Rose, north-east of Lake Tahoe in Washoe County, Nevada, but it is now extinct. West of the Sierra Nevada crest, the southern part of the *R. sierrae* range is bordered by ridges that divide the Middle and South Fork of the Kings River, ranging from Mather Pass to the Monarch Divide. East of the Sierra Nevada crest, *R. sierrae* occurs in the Glass Mountains just south of Mono Lake (Mono County) and along the east slope of the Sierra Nevada south to the type locality at Matlock Lake (Inyo County)." (Vredenburg, et al, 2007.) In 2008, the Society for the Study of Amphibians and Reptiles recognized two species, *Rana muscosa* - Southern Mountain Yellow-legged Frog and *Rana sierrae* - Sierra Nevada yellow-legged frog.

The nearest known population to the analysis area is seven stream miles west of the survey area in the Spanish Creek watershed. Streams east of the analysis area were surveyed in 2004 for the Empire project. No SNYF were found during that survey. Project-specific surveys in 2010 yielded no SNYF observations along Greenhorn Creek. Although habitat exists along the creek that could support SNYF, it is unlikely that this species occurs in the analysis area.

#### **Direct, Indirect and Cumulative Effects of the Proposed Action and No Action**

Although habitat exists for this species in the project area, no individuals have been found, therefore it is very unlikely that there would be a direct, indirect, or cumulative impact to individuals. Habitat would directly be impacted by increased sediment and de-watering during construction. These actions could indirectly negatively impact SNYF habitat by temporarily reducing aquatic macroinvertebrates that SNYF prey upon. Macroinvertebrate populations, however, are expected to increase in the long term, as sediment from eroding banks is reduced by the project. The project's effects on macroinvertebrates would affect trout as well as amphibians (and all species that feed upon macroinvertebrates).

Greenhorn Creek is locally known as a productive trout fishery. Trout can also prey upon sub-adult frogs and tadpoles. The natural productivity of trout in Greenhorn Creek may be a natural limiting factor precluding the expansion of SNYF and other sensitive amphibian species into this waterway. Thus, since trout already occupy the habitat, and sensitive frogs do not, it is likely that the Proposed Action would continue to favor trout, and therefore have no indirect effect on SNYF or other sensitive amphibians.

Cumulatively, the project is expected to reduce some of the impacts of agriculture, enhance other soil and water protection actions in the watershed, and incrementally contribute to the benefits associated with bank stabilization and fish passage projects on private land in the Integrated Greenhorn Creek Restoration Project. These cumulative impacts are expected to benefit SNYF habitat by improving water quality and increasing stream bank vegetation. However, as discussed above, this would also improve conditions for trout, thus resulting in no cumulative effect on SNYF.

#### **Direct, Indirect and Cumulative Effects of No Action**

The No Action Alternative would result in no direct impacts due to construction. There would be no indirect effects due to a temporary reduction in macroinvertebrates. Current conditions and trends would remain the same within the analysis area. Gullied stream banks would continue to erode, resulting in a continued loss in the quality and quantity of riparian and aquatic habitats. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from reasonably foreseeable treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area, but because of the trout population, there is likely to be no effect on SNYF.

#### **Summary of Effects for Sierra Nevada Yellow-legged Frog**

Neither the Proposed Action nor the No Action alternative would affect individuals because there are none in, or closer than seven miles from, the project area. In the short term, habitat would be negatively directly affected by the Proposed Action from disturbance during construction, and indirectly negatively affected due to the potential loss of macroinvertebrates. In the long term, habitat would improve due to reduced sedimentation that would be expected to improve macroinvertebrate populations. However, this improvement, when considered in the presence of a trout population, and with the cumulative effects of other treatments in the proposed Integrated Greenhorn Creek Restoration Project would continue to favor trout as well. Since trout occur in project area, and SNYF do not, Proposed Action and cumulative effects from other activities are likely to continue to preclude SNYF from colonizing the project area, resulting in no effect to SNYF or their habitat.

#### **Determinations – Sierra Nevada yellow-legged frogs**

It is my determination that the Proposed Action would not affect the Sierra Nevada yellow-legged frog. It is my determination that the No Action alternative would not affect the Sierra Nevada yellow-legged frog.

### **FOOTHILL YELLOW-LEGGED FROG (FYLF) (*Rana boylei*)**

The FYLF is a Forest Service sensitive species. The elevational range of the FYLF extends from sea level to 6,370 ft. The frog is found in or near rocky streams in a variety of habitats including those found within the project area.

FYLF are known to occur along Spanish Creek in, and above American Valley, approximately six stream miles west of the analysis area. Streams east of the analysis area were surveyed in 2004 for the Empire project. No FYLF were found during that survey, nor were any found during project-specific surveys for the Integrated Greenhorn Creek Restoration Project in 2010.

### **Direct, Indirect and Cumulative Effects of the Proposed Action and No Action**

While the habitat for FYLF slightly differs from habitat preferences for the SNYF, direct, indirect, and cumulative effects to this species would be the same as the effects discussed above for the SNYF.

### **Determinations – Foothill yellow-legged frogs**

It is my determination that the Proposed Action would not affect the foothill yellow-legged frog.

It is my determination that the No Action alternative would not affect the foothill yellow-legged frog.

### **PACIFIC POND TURTLE (PPT) (*Actinemys marmorata marmorata*)**

A Forest Service sensitive species, this aquatic-oriented reptile was recently divided into two subspecies in northern and southern California. Plumas County populations fall into the northern subspecies which is *A. marmorata marmorata*. The species is found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, PPT prefers pools to shallower areas. Logs, rocks, cattail mats, or exposed banks are required for basking.

PPT are known to occur immediately adjacent to the analysis area in a ranch pond, as well as in at least one other pond within American Valley along Spanish Creek. PPT have also been documented occupying Greenhorn Creek near the Quincy Junction Road bridge (1991, 1993, 1995 Plumas NF database, Rotta personal observation). However, there were no sightings of PPT during project-specific surveys on Greenhorn Creek in 2010. Habitat exists for the species in the slower moving/pool areas of Greenhorn Creek within the analysis area, and within the treatment unit polygons.

### **Direct Effects of the Proposed Action**

Because of the proximity of known PPT to the analysis area, and suitable habitat within each of the treatment polygons, there is a potential for individuals to be negatively impacted in the short term during

construction via direct crushing from heavy equipment. This however, is unlikely because of the high degree of site fidelity displayed by these animals. Short term negative direct impacts to habitat include those discussed for the three amphibian species, i.e. temporarily increased sedimentation, and a temporarily de-watered channel bottom. Long term direct effects to habitat are expected to be beneficial: increased basking sites along the toe of the newly sloped bank and on the vane boulders. These beneficial impacts would occur immediately after construction and into the future.

**Mitigation** recommended to reduce negative short term direct impacts is to survey the project area for turtles prior to construction, to ensure that none are present and in danger of trampling from heavy equipment.

#### **Indirect Effects of the Proposed Action**

Indirect effects to PPT are similar to indirect effects to amphibians, because macroinvertebrates are an important food source for PPT as well as amphibians. As with the discussions above for SNYF, and FYLF, the project is expected to have a short term negative indirect impact due to the loss of macroinvertebrates during construction. However, long term indirect impacts are expected to be beneficial, due to reduced sedimentation that should enhance habitat for macroinvertebrates, thus improving this food source for PPT.

#### **Cumulative Effects of the Proposed Action**

Cumulative impacts to PPT are similar to those described above for amphibians, although to a somewhat lesser degree. Trout can prey upon young turtles, as they can upon amphibians, but are likely to favor amphibians over turtles.

#### **Summary of Effects of the Proposed Action**

The Proposed Action is not expected to impact individuals, but may negatively affect PPT habitat in the short term, and improve habitat in the long term.

#### **Direct, Indirect and Cumulative Impacts of No Action**

The No Action Alternative would result in no direct impacts due to construction. There would be no indirect effects due to a temporary reduction in macroinvertebrates. Current conditions and trends would remain the same within the analysis area. Gullied stream banks would continue to erode, resulting in a continued loss in the quality and quantity of riparian and aquatic habitat for the PPT. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from reasonably foreseeable treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

#### **Determinations – Pacific Pond Turtle**



It is my determination that the Proposed Action may affect individuals but is not likely to result in a trend toward federal listing or loss of viability for the Pacific pond turtle.

It is my determination that the No Action alternative would not affect the Pacific pond turtle.

#### **BALD EAGLE (*Haliaeetus leucocephalus*)**

The bald eagle is a Forest Service sensitive species. Bald eagles prefer habitats near seacoasts, rivers, large lakes, oceans, and other large bodies of open water with an abundance of fish. Studies have shown a preference for bodies of water with a circumference greater than 11 km (7 mi). Lakes with an area greater than 10 square kilometers (4 sq mi) are optimal for breeding bald eagles. This species requires old-growth and mature stands of trees for perching, roosting, and nesting. Selected trees must have good visibility, an open structure, and proximity to prey, but the height or species of tree is not as important as an abundance of comparatively large trees surrounding the body of water. Forests used for nesting should have a canopy cover of no more than 60 percent, and no less than 20 percent, and be in close proximity to water.

The nearest nesting territory is found approximately five miles west of the project area. There are no bodies of water large enough to meet the above territory/habitat needs that could support a bald eagle territory within the analysis area, but bald eagles have been observed within the analysis area, and it is possible that bald eagles use Greenhorn Creek within the analysis area for infrequent foraging. There is not nesting habitat within the analysis area.

#### **Direct Effects of the Proposed Action**

Short term negative direct effects to bald eagle include potential disturbance to foraging due to noise and equipment movement during construction. This effect is likely to be minimal because the Proposed Action in the Reid/PNF Treatment Unit only occurs on 390 feet of stream channel, out of a total of 3.9 miles of stream channel in the analysis area. Construction would only occur during a maximum time period of two weeks. During construction there is ample area of stream channel available for foraging.

#### **Indirect Effects of the Proposed Action**

Indirect effects to bald eagle would be long term beneficial effects, as the project is expected to improve conditions for trout, thus improving the food supply for bald eagle.

#### **Cumulative Effects of the Proposed Action**

Intensive grazing can impact the wildlife value of riparian areas. For eagles, grazing in the analysis area likely contributes to a reduction of prey species. The Proposed Action is expected to improve riparian habitat by increasing streamside vegetation, thereby contributing to a cumulative benefit to bald eagles. Reasonably foreseeable fish passage and bank stabilization in the five other treatment units in the Integrated Greenhorn Creek Restoration Project would also cumulatively improve foraging habitat for bald eagles by improving habitat for trout, a preferred food item.

### **Summary of Effects of the Proposed Action**

Bald eagle may be minimally impacted during construction from heavy machinery, but are likely to benefit from the project in the long term from the expected increase in trout, on which they feed.

### **Direct, Indirect and Cumulative Impacts of No Action**

The No Action Alternative would result in no direct impacts due to construction. There would be no indirect effects of improved trout prey. Current conditions and trends would remain the same within the analysis area. Gullied stream banks would continue to erode, resulting in a continued loss in the quality and quantity of riparian and aquatic habitat, upon which bald eagle prey depend. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from reasonably foreseeable treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

### **Determinations – Bald Eagle**

It is my determination that the Proposed Action may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for the bald eagle.

It is my determination that the No Action alternative would not affect the bald eagle.

### **NORTHERN GOSHAWK (*Accipiter gentilis*)**

The northern goshawk is a Forest Service sensitive species. This species is a large, forest-dwelling raptor that inhabits the forests of northern coastal California and the northern Sierra Nevada. Its summer range extends into northern Alaska and throughout the northeastern United States. Northern goshawks depend on mature to old-growth forests for nesting and foraging, with high canopy closure and large trees (Greenwald et al. 2005). In the managed landscapes of northern California, habitat used by adult northern goshawks and their fledged juvenile offspring are characterized by patches of unmanaged or lightly harvested forest (Woodbridge et al. 1999). However, home-range and territories of northern goshawks can include mature and managed forests (Woodbridge et al. 1999), provided canopy cover, tree density, and down woody debris cover are high (Greenwald et al. 2005).

The closest goshawk Protected Activity Center (PAC) to the analysis area is three miles to the east. Goshawks are not expected to be found in the analysis area, as it is comprised of open meadow/pasture and entrenched riparian habitats. There is a small hillside patch of mixed conifer forest to the west of the analysis area, however, there is no habitat that could support a viable goshawk territory within or near the analysis area.

### **Direct, Indirect and Cumulative Impacts of Proposed Action and No Action**

There is no nesting or foraging habitat for northern goshawk within the analysis area. The project would not affect any large diameter conifer or riparian deciduous trees, nor would it affect over-story structure. The project may affect the open nature of the understory by increasing willow stands, however, this is not expected to affect goshawk foraging, because willows would only expand within the existing entrenchment. Therefore, there would be no direct, indirect, or cumulative effects of either alternative on this species or its habitat.

#### **Determinations – Goshawk**

It is my determination that the Proposed Action would not affect the goshawk.

It is my determination that the No Action alternative would not affect the goshawk.

#### **CALIFORNIA SPOTTED OWL (*Strix occidentalis occidentalis*)**

The California Spotted Owl (CSO) is a Forest Service sensitive subspecies of spotted owl that inhabits coniferous and hardwood forests of the southern Cascades, western Sierra Nevada, and central and southern coastal mountains of California (Verner et al. 1992). The species distribution is linked with large, mature trees in late-seral stage forests with high canopy cover (Gutierrez et al. 1992).

The nearest PAC is three miles east of the project area in forested habitat. Spotted owls are not expected to be found in the analysis area, as it is comprised of open meadow/pasture and entrenched riparian habitats. There is a small hillside patch of mixed conifer forest to the west of the analysis area, however, there is no habitat that could support a viable spotted owl PAC within or near the analysis area.

#### **Direct, Indirect and Cumulative Impacts of Proposed Action and No Action**

There is no nesting or foraging habitat for spotted owls within the analysis area. No trees would be impacted by the project. Therefore, there would be no direct, indirect, or cumulative effects of either alternative on this species or its habitat.

#### **Determinations – Spotted Owl**

It is my determination that the Proposed Action would not affect the spotted owl.

It is my determination that the No Action alternative would not affect the spotted owl.

#### **GREAT GRAY OWL (GGO) (*Strix nebulosa*)**

The great gray owl (GGO) is a Forest Service sensitive species. It is a rare breeding bird in the United States south of Canada, and only isolated populations are known to occur in the lower 48 states, mainly west of the Rocky Mountains. These owls are thinly distributed through the Cascade Mountains of Washington and Oregon, with the exception of rather dense populations in the Blue Mountains of northeastern Oregon (Bull and Henjum 1990) and the mountains of Southwestern Oregon (Fetz et al. 2000). They are very rare in the Cascade/Siskiyou systems of California, with only a few historic records

known from Del Norte, Plumas, Shasta, and Siskiyou Counties. GGO were detected approximately 15 miles east of the analysis area near Lake Davis by the contractor in 2004-2008 with over 50 separate detections over that period. No project level surveys were conducted for the Integrated Greenhorn Creek Restoration Project, however, during protocol surveys for nearby forest management projects in recent years on the Mount Hough Ranger District (Empire, 2004-2005 and others in the 2000's), no GGO were detected.

#### **Direct, Indirect and Cumulative Impacts of Proposed Action and No Action**

The open meadow and portions of ungrazed pasture within the analysis area provide some foraging habitat for this species. There is no nesting habitat for GGO within the analysis area. No trees would be impacted by the project. The project would not impact open meadow pasture habitat. Therefore, there would be no direct, indirect, or cumulative effects of either alternative on this species or its habitat.

#### **Determinations – Great Gray Owl**

It is my determination that the Proposed Action would not affect the great gray owl.

It is my determination that the No Action alternative would not affect the great gray owl.

#### **WILLOW FLYCATCHER (WIFL) (*Empidonax trailii brewsteri*)**

Willow flycatcher is a Forest Service sensitive species. It is one of the largest flycatchers in the genus *Empidonax*, and occurs in California in willow thickets with open grassy areas and open pooled water nearby, and occurs mostly in montane environments. The two closest known populations of willow flycatchers are approximately 12-15 miles south, and west, of the analysis area. Potentially suitable, but marginal, habitat occurs in the treatment units and analysis area of the Integrated Greenhorn Creek Restoration Project. Project-level protocol surveys were completed for WIFL in 2010 in the treatment units. No WIFLs were found.

#### **Direct Effects of the Proposed Action**

Because of the presence of suitable habitat, it is possible that WIFL could occupy the Reid/PNF Treatment Unit, as well as any of the other treatment units, during the year of construction. To avoid direct impacts to individuals, **mitigation** should include either constructing the project outside of the Limited Operating Period (LOP), which is after August 31, or conducting protocol surveys for WIFL to determine presence and location prior to any disturbance if construction is planned to commence before August 31. If WIFL are detected, construction should either be delayed, or activities should be limited, so that a quarter mile buffer of no disturbance is maintained around the nest site. With this mitigation measure, there should be no direct impact to individuals, however it is possible that individuals could be missed in a survey.

Direct impacts to habitat would include disturbance to willows during construction. Selected willow plants would be uprooted with heavy equipment from the bank opposite of the treatment bank, and planted at the toe of sloped treatment bank. This use of vegetation has been shown in previous similar projects to improve riparian habitat, with excellent survival of transplanted plants. Thus, in the long term (3-5 years), the Proposed Action is expected to improve WIFL habitat by expanding willow habitat onto a bank that currently does not support vegetation.

#### **Indirect Effects of the Proposed Action**

Because one of the primary food sources of WIFL is winged adult macroinvertebrates, there would be a temporary indirect negative impact to WIFL due to construction, and a long term beneficial effect. The effect of construction has been mentioned above for amphibians and turtles. This indirect effect is the same for any species for which macroinvertebrates are an important food source: a minimal temporary decrease in macroinvertebrates in the immediate work area due to de-watering and increased sedimentation, and a long term beneficial increase in macroinvertebrates due to decreased sedimentation.

#### **Cumulative Effects of the Proposed Action**

The primary land use in the analysis area is grazing. Cowbird nest parasitism is known to negatively impact willow flycatcher reproduction. Grazing would continue to occur in the analysis area under either alternative, thus the Proposed Action would have no effect on this cumulative effect.

Reasonably foreseeable future bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct and indirect effects from the 1.2 acre, 390 foot channel treatment to a total of 21.3 acres, and 1.3 miles of stream channel treatment. Within the context of the entire 404 acre analysis area, this cumulative effect would be minimal in the short term, as construction would occur over at least two years, and only occur in five percent of the total analysis area, and 33% of the total channel miles. The proposed treatments in the Integrated Greenhorn Creek Restoration Project are expected to be cumulatively beneficial in the long term, with an expected measurable decrease in sedimentation from all of the proposed treatments.

#### **Summary of Effects of the Proposed Action**

Mitigations described under direct effects would minimize potential direct negative effects to individuals. Long term direct effects on habitat would be beneficial. Short term indirect effects on macroinvertebrates would be negative, but long term impacts would be beneficial. Cumulative impacts from other actions in the Integrated Greenhorn Creek Restoration Project would expand the extent of short term negative and long term beneficial impacts. Short term cumulative impacts are expected to be minimal in the context of the analysis area. Long term cumulative impacts are expected to provide measurable improvements.

#### **Direct, Indirect and Cumulative Effects of No Action**

The No Action Alternative would result in no direct or indirect impacts due to construction. Current conditions and trends would remain the same within the project area. The stream bank would continue to erode, resulting in a continued loss in the quality and quantity of riparian habitat, upon which WIFL depend. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

#### **Determinations – Willow Flycatcher**

It is my determination that the Proposed Action may affect individuals but is not likely to result in a trend toward federal listing or loss of viability for the willow flycatcher.

It is my determination that the No Action alternative would not affect the willow flycatcher.

#### **GREATER SANDHILL CRANE (*Grus canadensis tabida*)**

The greater sandhill crane is a Forest Service sensitive species. It is the largest of six subspecies of sandhill cranes that occur throughout North America. There are five recognized populations of greater sandhill cranes. The population that occurs in California is known as the Central Valley population. These birds winter in California's Central Valley, and nest in northeastern California, eastern Oregon, portions of Nevada and Washington, and British Columbia. Oregon and British Columbia support the majority of the nesting population and only a few pairs are found in Nevada and Washington. It is thought that 200-300 pairs nest in northeastern California. Recent estimates place the entire Central Valley population of greater sandhill cranes between 4,000 and 5,000 birds. Sandhill cranes utilize wet meadow, shallow lacustrine, and fresh emergent wetland habitats. Sandhill cranes are known to nest within the analysis area, however, they are not known to nest within any of the treatment units in the Integrated Greenhorn Creek Restoration Project.

#### **Direct Effects of the Proposed Action**

Nesting activities can occur from April to August. Sandhill cranes are sensitive to disturbance from human and grazing activity during nesting. To avoid direct impacts to individuals, **mitigation** should include either constructing the project outside of the Limited Operating Period (LOP), which is after August 1, or surveying for cranes to determine presence and location prior to any disturbance if construction is planned to commence before August 1. If cranes are detected, construction should either be delayed, or activities should be limited, so that a half mile buffer of no disturbance is maintained around the nest site. With this mitigation measure, there should be no direct impact to individuals, however, it is possible that individuals could be missed in a survey. Sandhill cranes have been observed in the analysis area in wet meadow areas away from the gullied main stem channel, where proposed activities would occur. It is not likely that cranes would use the wet areas within the confines of the gullied channel, therefore, there would be no direct effect on sandhill crane habitat due to the Proposed Action.

### **Indirect Effects of the Proposed Action**

Since sandhill cranes are not likely to use the gullied channel environs for foraging, it is unlikely that the Proposed Action would have an indirect effect on sandhill cranes.

### **Cumulative Effects of the Proposed Action**

While grazing can disturb nesting sandhill cranes, they are known to nest in the analysis area. Grazing land use in the analysis area helps to maintain the open meadow space preferred by sandhill cranes. Grazing would continue to occur in the analysis area under either alternative, thus the Proposed Action would have no effect on this cumulative effect.

As discussed under willow flycatchers, reasonably foreseeable bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct and indirect effects. A LOP would also be recommended for these treatments, thus minimizing this potential effect to individuals.

### **Summary of Effects of the Proposed Action**

A LOP would minimize potentially negative direct and cumulative effects to the sandhill crane from disturbance during construction. Since sandhill cranes do not use habitat near the confines of the gully, there would be no direct nor indirect effects on habitat.

### **Direct, Indirect, and Cumulative Effects of No Action**

The No Action Alternative would result in no direct or cumulative impacts due to construction. Sandhill cranes do not use the proposed action treatment area, nor other treatment areas in the Integrated Greenhorn Creek Restoration Project, thus No Action would not affect sandhill crane habitat. Cumulative effects due to grazing would remain the same under either alternative. Current conditions and trends would remain the same within the project area.

### **Determinations – Sandhill Crane**

It is my determination that the Proposed Action may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for the sandhill crane.

It is my determination that the No Action alternative would not affect the sandhill crane.

### **PALLID BAT (*Antrozous pallidus*), TOWNSEND'S BIG-EARED BAT (*Corynorhinus townsendii*), and WESTERN RED BAT (*Lasiurus blossevillii*)**

Pallid bat, Townsend's big-eared bat and western red bats are all Forest Service sensitive species. No project-specific surveys were conducted for bats. All three species are known to occur in Plumas County.

**Pallid bat** is a locally common species that most abundant below 6,000 feet in elevation, but have been recorded up to 10,000 feet in the Sierra Nevada (USDA Forest Service 2001). A wide variety of habitats is occupied, including grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests. The species is most common in open, dry habitats with rocky areas for roosting. Roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings. CNDDDB report of a mist-netted 12 individuals in summer, 2007. Surveys conducted by the Plumas National Forest during the past decade have found pallid bats near Portola, which is 25 miles east of the project area, and is dominated by pine and sagebrush habitat, most typical of this species' habitat preferences. There is no roosting habitat for this species in the analysis area.

**Townsend's big-eared bats** will use a variety of habitats, almost always near caves or other roosting areas. They can be found in pine forests and arid desert scrub habitats. When roosting they do not tuck themselves into cracks and crevices like many bat species do, but prefer large open areas. The closest known sighting of this species, in July 2007, was within one mile, west of the analysis area. There are abundant ponderosa pine forests surrounding the analysis area, but not within the analysis area.

**Western red bat** is a typical tree bat, which is closely associated with cottonwoods in riparian areas at elevations below 6,500 feet. Especially favored roosts are found where leaves form a dense canopy above and branches do not obstruct the bats' flyway below. Roosts are often in edge habitats adjacent to streams, fields, or urban areas. They appear to be highly associated with intact riparian habitat, particularly willows, cottonwoods, and sycamores (USDA Forest Service 2001). During winter, it migrates south where it hibernates. In California, it is mostly a summer visitor, ranging all over the state in various areas except the desert. Western red bats are known to occur 25 miles east of the project area in the mostly pine-dominated stands of eastern Plumas County, but none have been found in American Valley. There is marginal habitat for western red bat in the analysis area, with relatively few, small cottonwood trees, in an entrenched riparian area.

#### **Direct Effects of the Proposed Action on Pallid, Townsend's big-eared and Western red bats**

Because these bats can have a wide range, the Proposed Action has a potential for short-term, temporary disruption of riparian foraging, commuting, and roosting habitat for each of these species during construction due to heavy equipment noise and movement. However, this type of disturbance, (which occurs during daylight hours, when foraging is not occurring), is expected to be minimal. There would be no long term disturbance to potential roosts because trees would not be affected by the Proposed Action. The Proposed Action remains within the immediate area of the gullied stream channel.

#### **Indirect Effects of the Proposed Action on Pallid, Townsend's big-eared and Western red bats**

Adult winged macroinvertebrates are an important food source for these bat species. As discussed above for turtles, cranes, and willow flycatchers, any species that relies on this food source would be temporarily indirectly affected by a reduction in macroinvertebrates due to construction. This effect is



expected to be minimal due to adjacent areas that would not be affected by the Proposed Action. Bats can fly and have unusually large home ranges for their size and are able to utilize multiple habitat settings for different purposes. In the long term, bats would indirectly benefit from the Proposed Action because of the decreased sedimentation that would benefit macroinvertebrate populations.

#### **Cumulative Effects of the Proposed Action on Pallid, Townsend's big-eared and Western red bats**

The primary land use, grazing, does not appear to affect bats, thus there would be no cumulative effects from grazing.

As discussed under willow flycatchers, reasonably foreseeable bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct and indirect effects from the 1.2 acre, 390 foot channel Reid/PNF Treatment Unit to a total of 21.3 acres, and 1.3 miles of stream channel treatment. Within the context of the entire 404 acre analysis area, this cumulative effect would be minimal in the short term, as construction would occur over at least two years, and only occur in five percent of the total analysis area, and 33% of the total channel miles. The proposed treatments in the Integrated Greenhorn Creek Restoration Project are expected to be cumulatively beneficial in the long term, with an expected measurable decrease in sedimentation from all of the proposed treatments, thus improving macroinvertebrate populations on which bats feed.

#### **Direct, Indirect, and Cumulative Effects of No Action on Bats**

The No Action Alternative would result in no impacts due to construction. Current conditions and trends would remain the same within the project area. The stream bank would continue to erode, resulting in continued sedimentation that degrades habitat for macroinvertebrates, upon which bats feed. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

#### **Determinations – Bats**

It is my determination that the Proposed Action may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for the pallid bat, Townsend's big-eared bat, nor the western red bat.

It is my determination that the No Action alternative would not affect the pallid bat, Townsend's big-eared bat, nor the western red bat.

### **SUMMARY OF MITIGATION MEASURES**

- Limited Operating Period that prohibits activity until after August 31, unless a site-specific survey is conducted that determines absence or presence and location of nesting WIFLs.

- Limited Operating Period that prohibits activity until after August 1, unless a site-specific survey is conducted that determines absence or presence and location of nesting cranes.
- Survey construction area for turtles to avoid direct trampling of individuals by heavy equipment.
- To protect aquatic macroinvertebrates, which are an important food source for many species, take all necessary precautions to maintain water quality, and minimize turbidity during construction, including diverting water around work areas, employing dams and sedimats, and pumping seeping groundwater.

## **SUMMARY OF DETERMINATIONS**

Table 5. Comparison of the determinations of each alternative on Threatened, Endangered, Candidate, and Sensitive animal species that potentially occur on the PNF. WNA = Will Not Affect; MAI = May Affect Individuals, but is not likely to result in a trend toward Federal listing or loss of viability.

Species	Alternative 1 (PA)	Alternative 2 (No-Action)
<b>AMPHIBIANS</b>		
California red-legged frog ( <i>Rana draytonii</i> )	WNA	WNA
Foothill yellow-legged frog ( <i>Rana boylei</i> )	WNA	WNA
Sierra Nevada yellow-legged frog ( <i>Rana sierrae</i> )	WNA	WNA
<b>REPTILES</b>		
Pacific pond turtle ( <i>Actinemys marmorata marmorata</i> )	MAI	WNA
<b>BIRDS</b>		
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	MAI	WNA
Greater sandhill crane ( <i>Grus canadensis tabida</i> )	MAI	WNA
Great Gray Owl ( <i>Strix nebulosa</i> )	WNA	WNA
Spotted Owl ( <i>Strix occidentalis</i> )	WNA	WNA
Goshawk ( <i>Accipiter gentilis</i> )	WNA	WNA
Willow flycatcher ( <i>Empidonax traillii brewsteri</i> )	MAI	WNA
<b>MAMMALS</b>		
Pallid bat ( <i>Antrozous pallidus</i> )	MAI	WNA
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	MAI	WNA
Western red bat ( <i>Lasiurus blossevillei</i> )	MAI	WNA

### **Compliance with HFQLGFRA ROD and FEIS**

Areas of suitable habitat have been surveyed to protocols based on the best available science, to determine information relevant to implementation of site-specific resource management activities. This BA/BE has documented the species surveys that were conducted for this project, as well as the protocols that were implemented. Where appropriate, limited operating periods (LOPs) would be applied to unsurveyed habitat considered to be suitable for threatened, endangered, or sensitive species: and to habitat considered suitable for any species for which viability may be a concern. See Table 2.3, page 2-8 (HFQLGFRA FEIS) and pages A-54, A-60 – A-62 (SNFPA FSEIS 2004 ROD). If target species are found, LOPs would be implemented on a site-specific basis. As surveys are conducted, and no target species are found, LOPs can be lifted.

The ROD for the HFQLGFRA FEIS requires analysis of connectivity. Habitat would not be altered to the extent of disrupting existing connectivity for any species. Connectivity, including hydrologic connectivity, would be maintained to allow movement of old forest or aquatic/riparian-dependent species between areas of suitable habitat.

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## APPENDIX A

**U.S. Fish & Wildlife Service**  
**Sacramento Fish & Wildlife Office**  
**Federal Endangered and Threatened Species that Occur in**  
**or may be Affected by Projects in the**  
**Plumas National Forest**

Database last updated: April 29, 2010

Report Date: August 23, 2010

### Listed Species

*Branchinecta conservatio* - Conservancy fairy shrimp (E)  
*Desmocerus californicus dimorphus* - valley elderberry longhorn beetle (T)  
*Hypomesus transpacificus* - delta smelt (T)  
*Oncorhynchus* (=Salmo) *clarki henshawi* - Lahontan cutthroat trout (T)  
*Oncorhynchus mykiss* - Central Valley steelhead (T)  
*Oncorhynchus tshawytscha* - Central Valley spring-run chinook salmon (T)  
*Oncorhynchus tshawytscha* - winter-run chinook salmon, Sacramento River (E)  
*Orcuttia tenuis* - slender Orcutt grass (T)  
*Pseudocopaodes eunus obscurus* - Carson wandering skipper (E)  
*Rana draytonii* - California red-legged frog (T)  
*Senecio layneae* - Layne's butterweed (=ragwort) (T)

### Candidate Species

*Ivesia webberi* - Webber's ivesia (C)  
*Martes pennanti* - fisher (C)  
*Rana muscosa* - mountain yellow-legged frog (C)

### Species with Critical Habitat Proposed or Designated in this National Forest

California red-legged frog (PX)  
California red-legged frog (X)  
slender Orcutt grass (X)

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### Key:

- (E) *Endangered* - Listed as being in danger of extinction.  
(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.  
(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.  
(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.  
*Critical Habitat* - Area essential to the conservation of a species.  
(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.  
(C) *Candidate* - Candidate to become a proposed species.  
(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.  
(X) *Critical Habitat* designated for this species

# INTEGRATED GREENHORN CREEK RESTORATION PROJECT

## Biological Evaluation

### For Threatened, Endangered or Sensitive Plant Species

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**Date:** September 13, 2010

#### Summary:

No occurrences of species of concern were previously known from within the Proposed Project area (see Botanical Prefield Review Information dated June 5, 2010). No Sensitive, Federal or State listed plant species of concern were found within the Proposed Project area (see Botanical Field Reconnaissance Report dated June 30, 2010).

The effects determination in this document concludes that:

1. There would be no effect to Threatened, Endangered, or Proposed plant species.
2. The "no action" alternative would not affect Federal or State listed species.
3. The action alternative will not affect individuals and will not cause a trend toward federal listing or loss of viability to Forest Service sensitive plant species.

## **I. INTRODUCTION**

### **PURPOSE:**

The purpose of this Biological Evaluation (BE) is to describe the effects of the Proposed Project on all threatened, endangered and sensitive (TES) plant species of record for the project area. The objectives of the BE are:

1. To ensure that Project actions do not contribute to loss of viability of any native or desired non-native plant species.
2. To ensure that Project actions do not hasten the federal listing of any species.
3. To provide a process and standard through which TES species receive full consideration throughout the planning process, reducing negative impacts to species and enhancing opportunities for mitigation.

### **PROJECT NAME, TYPE AND LOCATION:**

**Name:** Integrated Greenhorn Creek Restoration Project

**Type:** This is a stream restoration project. See Section IV: "Description of Project".

**Location:** From Quincy, CA, take Quincy Junction Road off Highway 70/89 from the middle of town about 2 miles to the junction of Chandler Road. The Proposed Project locations are all in the general vicinity (see attached maps).

### **FIELD RECONNAISSANCE:**

**Date(s) of field work:** June 11-16, 2010

**By:** Jim Battagin, Butterfly Botanical Consultants

**Number of acres surveyed:** Approx. 34 acres.

**The area indicated on the attached map was surveyed for the following species of concern as determined by the Botanical Prefield Review Information (see Botanical Prefield Review Information dated 6-5-10):**

*Carex sheldonii*, *Cypripedium montanum*, *Lupinus dalesae*, *Orcuttia tenuis* and *Pseudostellaria sierrae*.

Further, a plant species list was assembled (see "Plant Species List and Information – Integrated Greenhorn Creek Restoration Project" dated June 20, 2010). This ensures



that any species not listed in the Botanical Prefield Review Information or any initially unknown plants are identified and considered.

**The following type of reconnaissance(s) was conducted in the project area:**

**Cursory:**\_\_\_ **General:**\_\_\_ **Complete:**  X  **Intuitive controlled:**  X

**The reconnaissance was conducted in the following manner:** The entire project area was viewed from various distances (intuitive survey). Areas that were thought to be potential habitat for target species were viewed more closely (complete survey) at a phenologically appropriate time.

**Species located:** None.

**Unoccupied habitat located (how much, where, description):** Potential habitat may exist within the Proposed Project area for:

*Carex sheldonii*, a Category 2 Special Interest Species.

However, no unoccupied potential habitat was positively identified.

## **II. CONSULTATION TO DATE:**

No formal or informal consultation with the USFWS has been conducted since no threatened, endangered or candidate species were found in the Proposed Project area. The latest USFWS species list for Plumas County/Plumas National Forest was accessed from the USFWS website. This list fulfills the requirements to provide a current species list pursuant to Section 7(c) of the Endangered Species Act, as amended. The United States Fish and Wildlife Service (USFWS) list of federally listed threatened and endangered plant species potentially occurring in the Plumas National Forest includes one threatened plant species, *Orcuttia tenuis* (slender Orcutt grass). *Orcuttia tenuis* is limited to relatively deep vernal pools or vernal pool type habitat with clay soil. No vernal pools were found during field surveys and none are known to occur in the Proposed Project area. Therefore, no threatened or endangered species are considered likely to occur in the Proposed Project area. Consequently, threatened and endangered species will not be discussed in the affected species section of this biological evaluation.

## **III. CURRENT MANAGEMENT DIRECTION:**

### **Rare Plant Management:**

No federal or state listed species were found and therefore no management is required by law. Further, no USFS sensitive species were found.

### **Noxious Weed Management:**

See "NOXIOUS WEEDS" under Section VIII; Management Recommendations.

*Also see Appendix G: "Integrated Greenhorn Creek Restoration Project, Noxious Weed Risk Assessment" dated 9-10-10 for a complete analysis and recommendations for noxious weeds.*

## **IV. DESCRIPTION OF PROJECT:**

Greenhorn Creek is the primary water course through American Valley, and has been used as an important resource for both Euro-American settlers and Native Americans before them. Through recent history, existing uses and property boundaries have taken a toll on the ability of the system to ecologically absorb perturbations. The proposed treatments consider existing land uses, constraints, and channel dynamics, including bedload movement through the Greenhorn Creek system. The two fish passage structures, at the Shea Dam and Reid Dam at Highway 70 (treatments 2 and 5, listed below) would protect the dams from further erosion damage, and stabilize the channel bed and banks. Implementation at any of the treatment sites is not dependent upon implementation at any other site. However, all treatments are being analyzed under one environmental document as an integrated restoration approach across multiple jurisdictional boundaries. The following lists all Greenhorn Integrated Restoration Project treatments considered under this analysis:

1. Above and below Quincy Junction Road, boulder vanes would be installed on 1,800 feet of actively eroding banks for stabilization. Banks would be sloped and vegetated. Access into the APE would be from the Quincy Junction Road onto an existing ranch access route.
2. At the Shea Dam, 3,000 cubic yards of 4'-minus pit material would be used to create a 350'-long, fish passable riffle-pool structure. Bank stabilization using rock, vegetation, and/or sloping along 1,466 feet up and downstream of the dam. Access into the APE would be from the existing gravel driveway, which was constructed of imported fill.
3. At the Carol Lane East Bridge, boulder vanes would be installed along a 540 feet section of channel to stabilize the channel bed and bank. Access into the APE would be on the existing paved road.
4. At the Plumas National Forest/Reid bank, boulder vanes would be installed, and banks sloped and vegetated along a 390-foot section of actively eroding bank. Access into the APE from the paved road would be on the existing dirt ranch road, which was surveyed.
5. At the Highway 70 irrigation dam (Reid Dam), 5,000 cubic yards of material would be used to install a 450'-long fish-passable riffle pool structure. Banks would be sloped and vegetated. Access from the highway would be on an existing dirt ranch road in the APE, which was surveyed.

6. On the Farnworth property, boulder vanes would be installed along a 220 foot section of actively eroding bank. Banks would be sloped and vegetated. Access from the highway would be on an existing dirt ranch road in the APE, which was surveyed. Project equipment will include an excavator, a front end loader, and two dump trucks, which will access the project on existing paved roads, one gravel driveway, and three dirt roads.

## V. EXISTING ENVIRONMENT:

No known previous surveys have been conducted within the Proposed Project area in the past.

However, the following species of concern have been previously found within the general vicinity of the Proposed Project area (see Botanical Prefield Review Information dated June 5, 2010) and may have potential habitat within the area:

<u>Species</u>	<u>Rating*</u>
<i>Lupinus dalesae</i>	Sensitive
<i>Pseudostellaria sierrae</i>	Special Interest, Category 2

Other species of concern with potential to be within the Proposed Project area are:

<u>Species</u>	<u>Rating*</u>
<i>Carex sheldonii</i>	Report occurrences (Category 2)
<i>Cypripedium montanum</i>	Sensitive

\* The above ratings are all USFS categories.

For information on the life histories of these species (i.e. distribution, habitat, elevation, key features, look-alikes and flowering times) see Rare Plant Handbook, USFS, Plumas National Forest, August 1999.

## VI. EFFECTS OF THE PROPOSED PROJECT:

An effects analysis is a part of the biological evaluation process that is required in cases where sensitive plants have been found within or near proposed project areas. Effects are described as direct, indirect, and/or cumulative. The following summarizes the direct, indirect, and cumulative effects of the project on the sensitive-status plant species listed in the introduction.

**A. General Discussion of Direct, Indirect, and Cumulative Effects**

**Direct Effects:** Direct effects occur when sensitive plants are physically impacted by activities associated with the proposed action. Direct impacts can physically break, crush or uproot sensitive plants by driving over them, by covering them, by falling trees on them, or by seeding directly on top of them. Direct impacts to sensitive plants can physically damage the sensitive plant or the habitats where they grow. When too much of an individual plant is damaged, that plant may experience altered growth and development, and reduced or eliminated seed-set and reproduction. If the disturbance is severe, it can kill sensitive plants. These impacts to individual plants can reduce the growth and development, population size, and potentially the viability of a sensitive plant species across the landscape. For annual plant species, the timing of impacts is critical. Management actions which take place after annuals have set seed have much less impact than management actions performed prior to seed-set. Direct effects being considered in this discussion include re-sloping of stream channels and banks, construction of boulder vanes, vegetating the upper bank with native seed, and relocating gravel bars onto constructed floodplain banks.

**Indirect Effects:** The proposed action for bank stabilization treatments can indirectly impact sensitive plants by causing changes in vegetation composition and successional pathways of that vegetation, changing local hydrologic patterns in sensitive plant habitat, or by changing the soil characteristics of the habitat. Some of these changes may result from shifts in hydrologic, solar, and soil characteristics of their habitat. Management actions can also lead to changes in forage condition, and this can lead to changes in the foraging behavior of livestock and wildlife within the analysis area. New use patterns can result in different potential impacts to sensitive species. Indirect effects can also occur from noxious weed invasion or from impacts to pollinators or mycorrhizae associated with sensitive plant species. Indirect impacts can have positive or negative effects.

Some indirect effects, such as noxious weed invasion, potentially pose a highly negative impact to all plant habitats, although different habitats may be invaded by different species of noxious weeds. In riparian areas or wet meadows, Canada thistle (*Cirsium arvense*) and perennial pepperweed (*Lepidium latifolium*) may invade with potentially catastrophic results. Upland areas may be invaded by a host of noxious weeds such as yellow star thistle (*Centaurea solstitialis*), the knapweeds (*Centaurea* spp.), or annual grasses such as medusahead (*Taeniatherum caput-medusae*). These noxious weeds can lead to habitat changes that are detrimental to sensitive plant species. Noxious weeds, once established, could indirectly impact sensitive plant species through allelopathy (the production and release of plant compounds that inhibit the growth of other plants), changing the fire regime, or direct competition for nutrients, light, or water. Subsequent weed control efforts such as hand-pulling, hoeing, mowing, or herbicide application could also negatively impact sensitive plants.

**Cumulative Effects:** Past and current activities can alter sensitive plant occurrences and their habitats. Current management direction is designed to eliminate or reduce

possible negative cumulative impacts by protecting sensitive plant species from direct and indirect impacts. The following discussion provides an explanation of why this type of management is effective in reducing cumulative impacts.

MacDonald (2000) reports that a critical step in cumulative effects analysis is to compare the current condition of the resource (in this case sensitive plants) and the projected changes due to management activities (bank stabilization using heavy equipment) with the natural variability in the resources and processes of concern. This is difficult for sensitive plants since long-term data are often lacking, and many sensitive plant habitats have a long history of disturbance, i.e. an undisturbed reference is often lacking. For some species, particularly those that do not tolerate disturbance or are found under dense canopy conditions, minimizing on-site changes to sensitive plants is an effective way of reducing cumulative impacts. "If the largest effect of a given action is local and immediate, then these are the spatial and temporal scales at which the effect would be easiest to detect. If one can minimize the adverse effects at this local scale, it follows that there would be a greatly reduced potential for larger-scale effects" (MacDonald, 2000). For other species, particularly those that are disturbance tolerators or fire-followers, minimizing on-site changes could be detrimental. These species tolerate or benefit from on-site changes that result in opening the stand, reducing the potential for catastrophic fire, and increasing light reception in the understory. Thus, the response of sensitive plant species to the management activities is species-dependent.

If adverse effects are not minimized at the local level, cumulative effects will occur. Past and present forest management activities have caused changes in plant community structure and composition across the national forests. A few management activities that have cumulatively impacted sensitive plant occurrences on the Plumas National Forest include: historic grazing, timber harvest, fire suppression, prescribed fire, mining, recreational use, road construction, urban development, and noxious weed infestation. These cumulative impacts have altered the present landscape to various degrees. However, cumulative, direct and indirect effects can be minimized by following Forest Service standards and guidelines and by implementing mitigation measures to monitor or offset impacts to sensitive plants species. With these protective measures in place, cumulative effects are less likely to be adverse.

#### **A. Alternative 1: The Proposed Action: Direct, Indirect, and Cumulative Effects**

*Carex sheldonii*, may have potential habitat in the project area but was not found during botanical surveys. The potential habitat of this species may be treated under the proposed action since no occurrences were found. Although adequate botanical surveys have been performed in the project area, it is possible that isolated individuals may have been overlooked. Therefore, undiscovered individuals may be impacted inadvertently. For this reason (potential impact to undiscovered individuals) a determination of "may impact individuals but not likely to cause a trend toward federal listing or loss of viability" has been made for this species. However, if *Carex sheldonii* is discovered during project implementation, it is recommended that it be flagged and avoided if

feasible.

Note: *Carex sheldonii* is not protected by law or regulation on private lands and, although protection is recommended when feasible, it is not required.

#### Direct Effects

Stream channel rehabilitation and bank stabilization via mechanical treatment could cause detrimental effects to any sensitive species found in the project area. Using heavy machinery to perform restoration activities has the potential to directly impact sensitive plants by crushing plants, displacing soil and plants, or smothering plants with soil. Direct effects are unlikely since no sensitive plants were found. However, any undiscovered sensitive plants could be affected.

#### Indirect Effects:

Noxious weeds can be brought into the Project area in road materials and mulch. Once established, noxious weeds can be difficult to control and eliminate from an area. Noxious weeds displace native plant habitat and degrade watershed functions. If the standard management requirements such as inventory, avoiding noxious weed areas with watershed restoration activities when possible, cleaning equipment, using weed free material and mulch are utilized, the spread of noxious weeds can be greatly reduced.

Although there are many parts of the Project area that are already infected by noxious weeds, the standard management practices can help to prevent the introduction and spread of noxious weeds. It is not realistic to expect Project activities to actually reduce the size of already infected areas. (See supporting document in Appendix G; "Integrated Greenhorn Creek Restoration Project, Noxious Weed Risk Assessment").

#### Cumulative Effects:

Standard management practices required in the action alternative will minimize potential adverse direct effects to sensitive plant species (avoidance, deferred grazing, and noxious weed mitigations). Minimizing direct effects is the largest individual factor in diminishing cumulative effects to sensitive plant species.

Noxious weeds will continue to pose a threat to native plant habitat and sensitive plant species. With the mechanical treatments of the proposed action, noxious weeds can more easily invade the area. Cumulatively, if this disturbance is applied on a landscape level without standard management requirements, noxious weeds could easily become further established.

The cumulative effects from the proposed action are an extension of the direct and indirect effects especially if these effects are not mitigated. Known foreseeable future actions within or adjacent to the current project area include the continuation of grazing

on the property. Grazing can result in the degradation of sensitive species populations through trampling, loss of proper hydrologic function by streamside trampling, and the loss of reproduction for the season by browsing buds and flowers before they go to seed. Standards and guidelines apply to all foreseeable future actions and will reduce cumulative effects on sensitive plant species.

The extent of cumulative effects depends on the management of potential direct and indirect effects, as well as the attributes of the sensitive plant species located within the analysis area, their distribution within the analysis area, and the ability to design future projects with sensitive plant attributes in mind. Overall, management of the direct and indirect effects through project design and mitigation measures is assured to minimize the potential for cumulative effects. Adverse cumulative effects are not expected as a result of implementation of the Integrated Greenhorn Creek Restoration Project for the following reasons:

- The project area has been adequately surveyed for plant species of concern.
- no known occurrences of any species of concern were found.
- any species of concern that are discovered during Project activities will be flagged and avoided if possible while still carrying out the intent of the Project.

By reducing potential direct and indirect effects through botanical surveys, project design, and protection of existing sensitive plant populations, cumulative effects are expected to be minimal.

### **C) Alternative 2: No Action Alternative: Direct, Indirect, and Cumulative Effects**

#### **Direct Effects:**

There are expected to be no direct effects from the no-action alternative other than those associated with current ongoing non-project activities.

#### **Indirect Effects:**

Indirect effects from the no action alternative are those associated with continued habitat degradation through widening and downcutting of the stream, ongoing grazing, and the current and future effects of noxious weed infestation. Grazing activities are anticipated to continue in portions of the Proposed Project area and could possibly impact potentially undiscovered sensitive plants although none were discovered in the botanical survey

#### **Cumulative Effects:**

Probably the most important factors contributing to potential cumulative effects of the no action alternative would include those associated with continued degradation of

habitat through stream channel degradation with little effect on plants of concern.

## VII. DETERMINATION:

The Effects Determination discussed here is based on professional experience and judgment, existing information (including existing condition of the analysis area), and the potential impacts of the alternatives. An effects determination is also the culmination of the analysis of potential direct, indirect, and cumulative effects. Even if the potential direct effects are low, there is often the potential for the indirect or cumulative effects to affect (to some degree) the viability of the species.

It is my determination that the Integrated Greenhorn Creek Restoration Project:

### Alternative 2-No action:

X Will not affect: the USFWS threatened and endangered listed species *Orcuttia tenuis*, since no habitat was found in the Proposed Project area, or US Forest Service special interest species of concern: *Carex sheldonii*.

The no-action alternative will cause no significant direct, indirect, or cumulative effects to these species.

### Alternative 1-Proposed Action:

X Will not affect: *Orcuttia tenuis*. This species will not be impacted during implementation for the following reason: no potential habitat was found in the Proposed Project area.

X May impact individuals but not likely to cause a trend toward federal listing or loss of viability to:

*Carex sheldonii*, These species may be impacted during implementation for the following reason: undiscovered occurrences may exist in the project area. The project area has been adequately surveyed for species of concern, and such impacts are expected to minimal to none.

## VIII.MANAGEMENT RECOMMENDATIONS:

### RARE PLANT SPECIES OF CONCERN:

During the field reconnaissance, no plants of concern were found. In addition, no specific potential habitat for any plants of concern was found except possibly *Carex sheldonii*, a USFS special interest species. However, *Carex sheldonii* has never been found in the American Valley area. Therefore, it is unlikely that any plants of concern or their habitats will be encountered or affected during the implementation of this project. However, if any *Carex sheldonii* is encountered during Project activities, it is



recommended that it be flagged and avoided if possible. Protection is recommended when feasible, but not required by law or regulation.

However, should any plants of concern be discovered during project implementation, it is recommended that they be flagged and avoided if possible without until an analysis of their importance is completed.

#### NOXIOUS WEEDS:

The following noxious weeds were discovered during the Botanical Reconnaissance (see Botanical Field Reconnaissance Report, Integrated Greenhorn Creek Restoration Project, dated 6-30-10):

1. *Centaurea solstitialis* (Yellow Star-thistle):
2. *Cirsium arvense* (Canada Thistle):
3. *Taeniatherum caput-medusae* (Medusahead)

Occurrences of these species are quite widespread in the Proposed Project area and have the potential to spread with Project activities.

*Also see Appendix G: "Integrated Greenhorn Creek Restoration Project, Noxious Weed Risk Assessment" dated 9-10-10 for a complete analysis and recommendations for noxious weeds.*

#### IX. REFERENCES:

California Native Plant Society (2001). Inventory of Rare and Endangered Vascular Plants of California, 6th Edition. Sacramento.

Clifton, Glenn. Plumas County and Plumas National Forest Flora. 2005 Draft.

Mt. Hough Ranger District (USFS) Sensitive Plant GIS locations and Plant Occurrence Records, 2010.

MacDonald, Lee H. 2000. Evaluating and managing cumulative effects: process and constraints. Environmental Management. 26(3): 299–315.

Mt. Hough Ranger District (USFS) Noxious Weed GIS locations, 2010.

Noxious Weeds on the Plumas National Forest (1999). Compiled by Linnea Hanson, Plumas National Forest Botanist.

Plumas National Forest Priority Noxious Weed Species, April 15, 2008, author unknown.

Plumas National Forest, Region 5 Sensitive and Special Interest plant species list, June 24, 2010, author unknown.

Rare Plant Handbook, Plumas National Forest, USDA, August 1999.

Selected Noxious Weeds of Northeastern California. Northern Deputy Agricultural Commissioners and Sealers Association.

Selected Plants of Northern California and Adjacent Nevada. Vernon H. Oswald. October 2002.

Selected Rare Plants of Northern California, University of California Agriculture and Natural Resources Publication 3395, Edited by Gary Nakamura and Julie Kierstead Nelson, 2001.

The Jepson Desert Manual. Margriet Wetherwax, Managing Editor. 2002.

The Jepson Manual, Higher Plants of California, James C. Hickman, Editor, 1993.

## **X. CONTRIBUTORS:**

Jim Belshier-howe, Botanist, Mt. Hough Ranger District. Document assistance.

Michelle Coppoletta, Assistant Botanist, Mt. Hough Ranger District. May 2010.

## **XI. APPENDICES:**

**Appendix A:** Integrated Greenhorn Creek Restoration Project General Location Map.

**Appendix B:** Integrated Greenhorn Creek Restoration Project Botanical Survey Map.

**Appendix C1 through C5:** Integrated Greenhorn Creek Restoration Project Noxious Weed Location Maps.

**Appendix D:** Botanical Prefield Review Information for the Integrated Greenhorn Creek Restoration Project. Compiled by Jim Battagin, June 5, 2010.

**Appendix E:** Botanical Field Reconnaissance Report for the Integrated Greenhorn Creek Restoration Project. Compiled by Jim Battagin, June 30, 2010.

**Appendix F:** Plant Species List and Information for the Integrated Greenhorn Creek Restoration Project Compiled by Jim Battagin, dated June 20, 2010.

**Appendix G:** Noxious Weed Risk Assessment for the Integrated Greenhorn Creek Restoration Project. Compiled by Jim Battagin, dated September 10, 2010.

## Appendix A

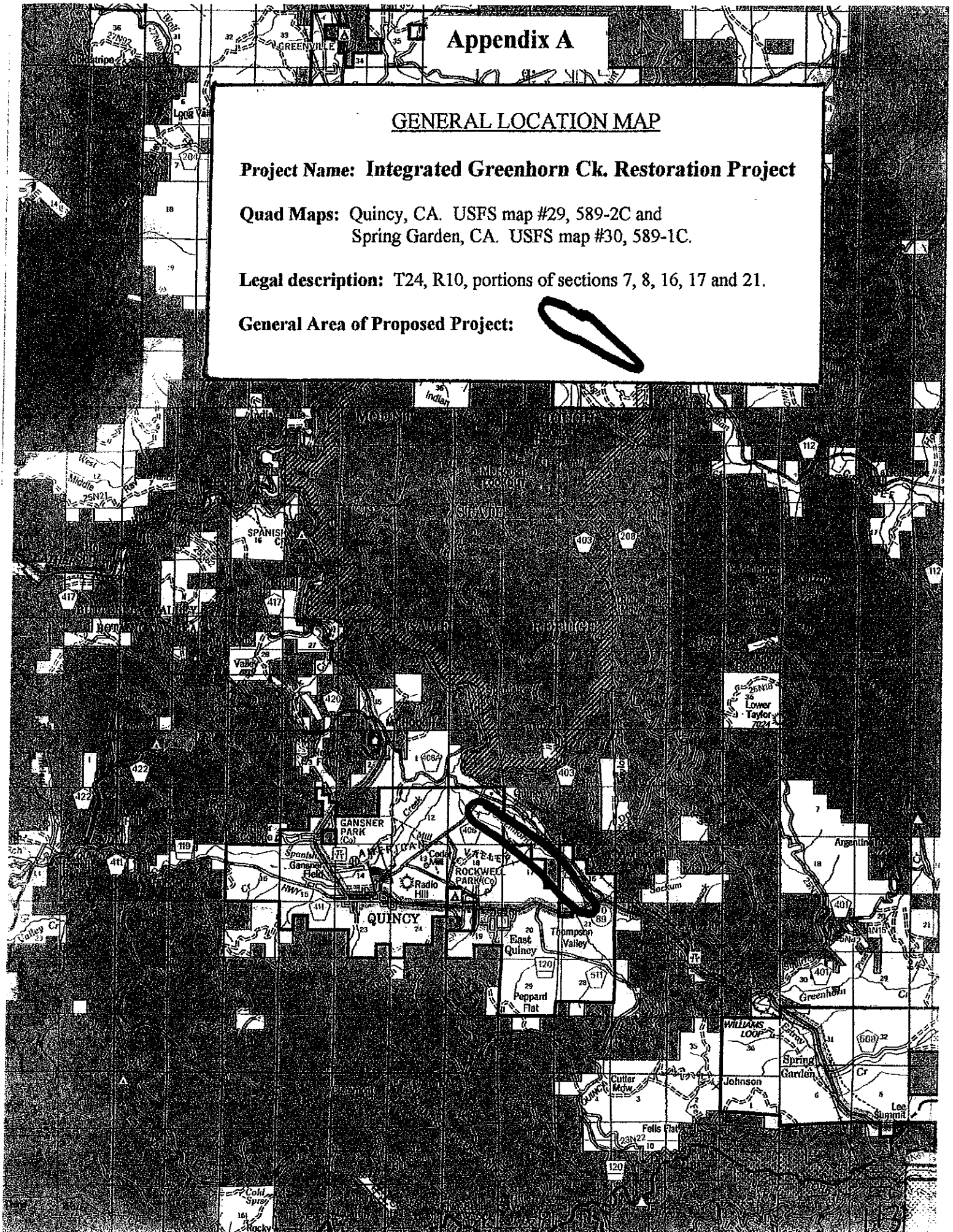
### GENERAL LOCATION MAP

**Project Name:** Integrated Greenhorn Ck. Restoration Project

**Quad Maps:** Quincy, CA. USFS map #29, 589-2C and  
Spring Garden, CA. USFS map #30, 589-1C.

**Legal description:** T24, R10, portions of sections 7, 8, 16, 17 and 21.

**General Area of Proposed Project:**



BOTANICAL SURVEY LOCATION MAP

Project Name: **Integrated Greenhorn Ck. Restoration Project**

Quad Maps: Quincy, CA. USFS map #29, 589-2C and  
Spring Garden, CA. USFS map #30, 589-1C.

Legal description: T24, R10, portions of sections 7, 8, 16, 17 and 21.

Project and Botanical Survey Area Boundaries:



**Appendix B**

# Greenhorn Creek Res Project Locations T24N R10E S21, 16, 1

Quincy Junction Rd

Shea-Hansen Bank Stabilization

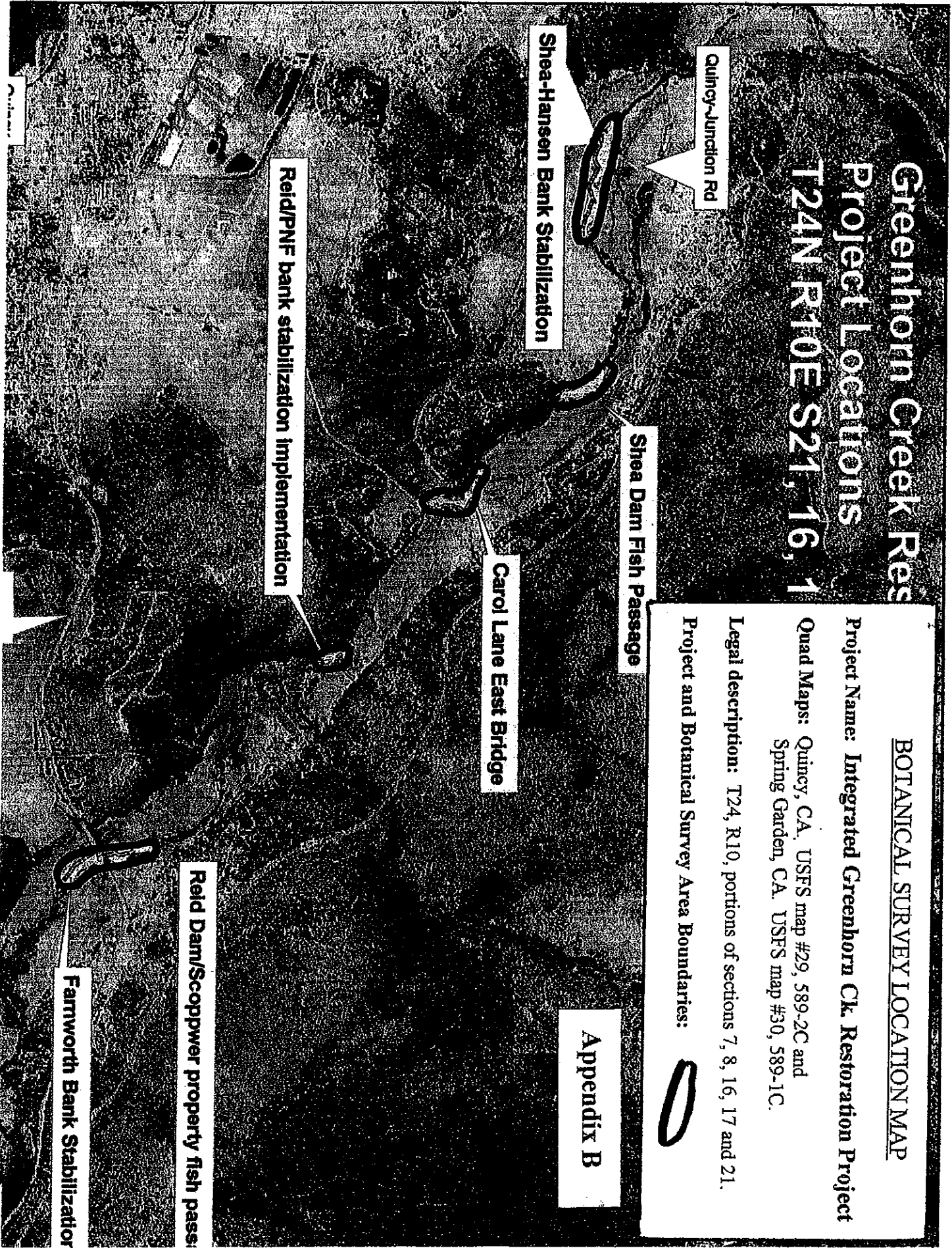
Shea Dam Fish Passage

Carol Lane East Bridge

Reid/PNF bank stabilization implementation

Reid Dam/Scoppwer property fish pass

Farrworth Bank Stabilizator



# KEY TO NOXIOUS WEED

## SPECIES CODES

For Integrated Greenhorn Creek  
Restoration Project

CADR = *Cardaria draba* (Hoary Cress)  
CESO = *Centaurea solstitialis* (Yellow Star-thistle)  
CIAR = *Cirsium arvense* (Canada Thistle)  
TACA = *Taeniatherum caput-medusae* (Medusahed)

## Appendix C1

## Legend

I	CADR
#	CESO
"	CIAR
K	TACA
G	TACA-CIAR
Occurrences	
	CESO
	CIAR
	CIAR-TACA
	TACA
	TACA-CESO
	Survey Boundary



0 62.5 125 250 375 500  
Feet  
Scale 1:2,500

Greenhorn Creek Restoration  
Shea-Hansen I

James Battaglin  
Butterfly Botanical Consultants

Compiled By: D.M. Churchill  
8/22/10



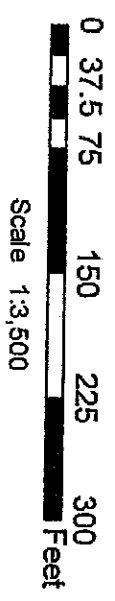
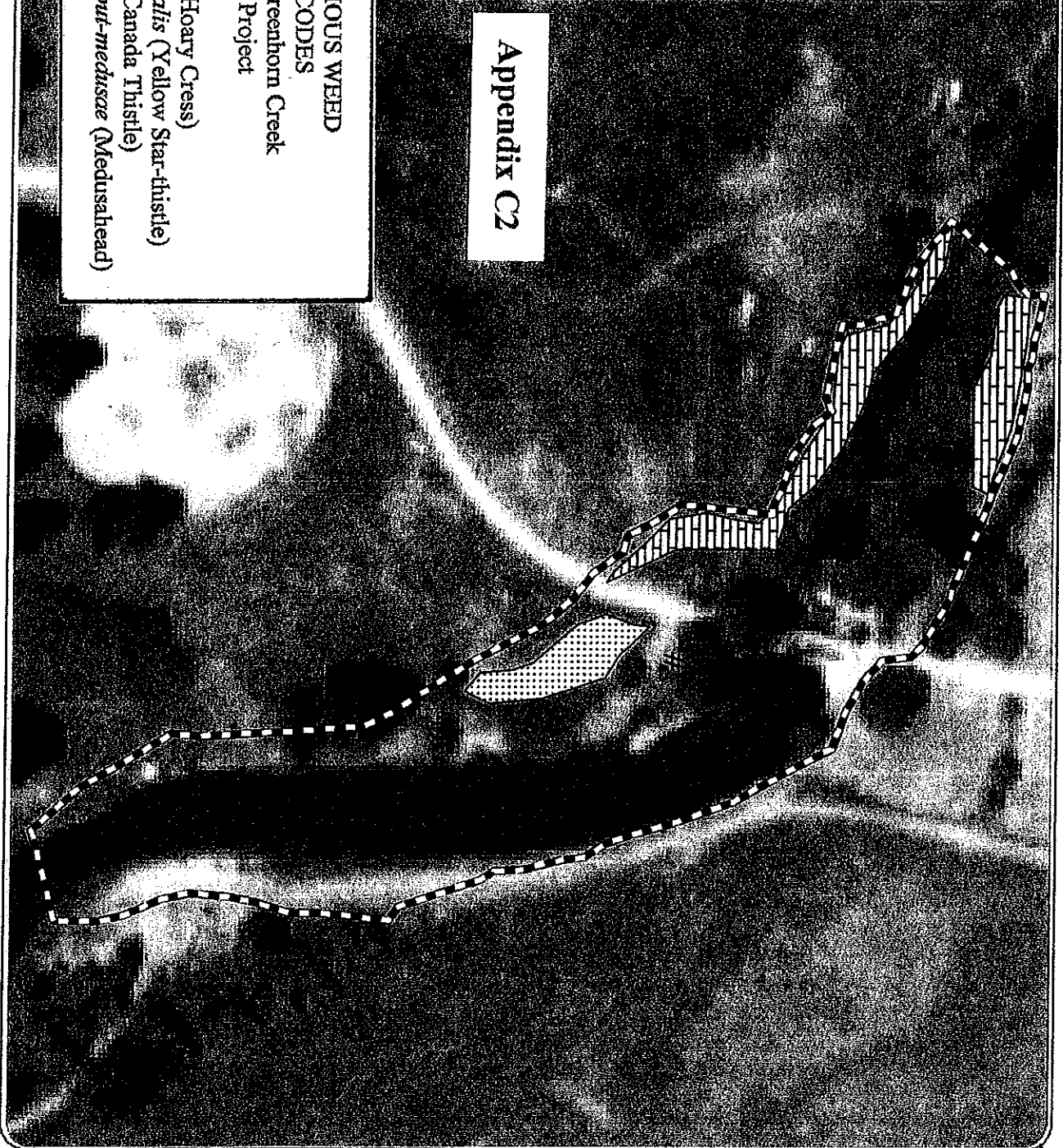
# Legend

- I CADR
- # CESO
- " CIAR
- K TACA
- G TACA-CIAR
- Occurrences
- CESO
- CIAR
- CIAR-TACA
- TACA
- TACA-CESO
- Survey Boundary

## Appendix C2

### KEY TO NOXIOUS WEED SPECIES CODES For Integrated Greenhorn Creek Restoration Project

- CADR = *Cardaria draba* (Hoary Cress)
- CESO = *Centaurea solstitialis* (Yellow Star-thistle)
- CIAR = *Chrysium arvense* (Canada Thistle)
- TACA = *Taenidherum caput-medusae* (Medusahed)

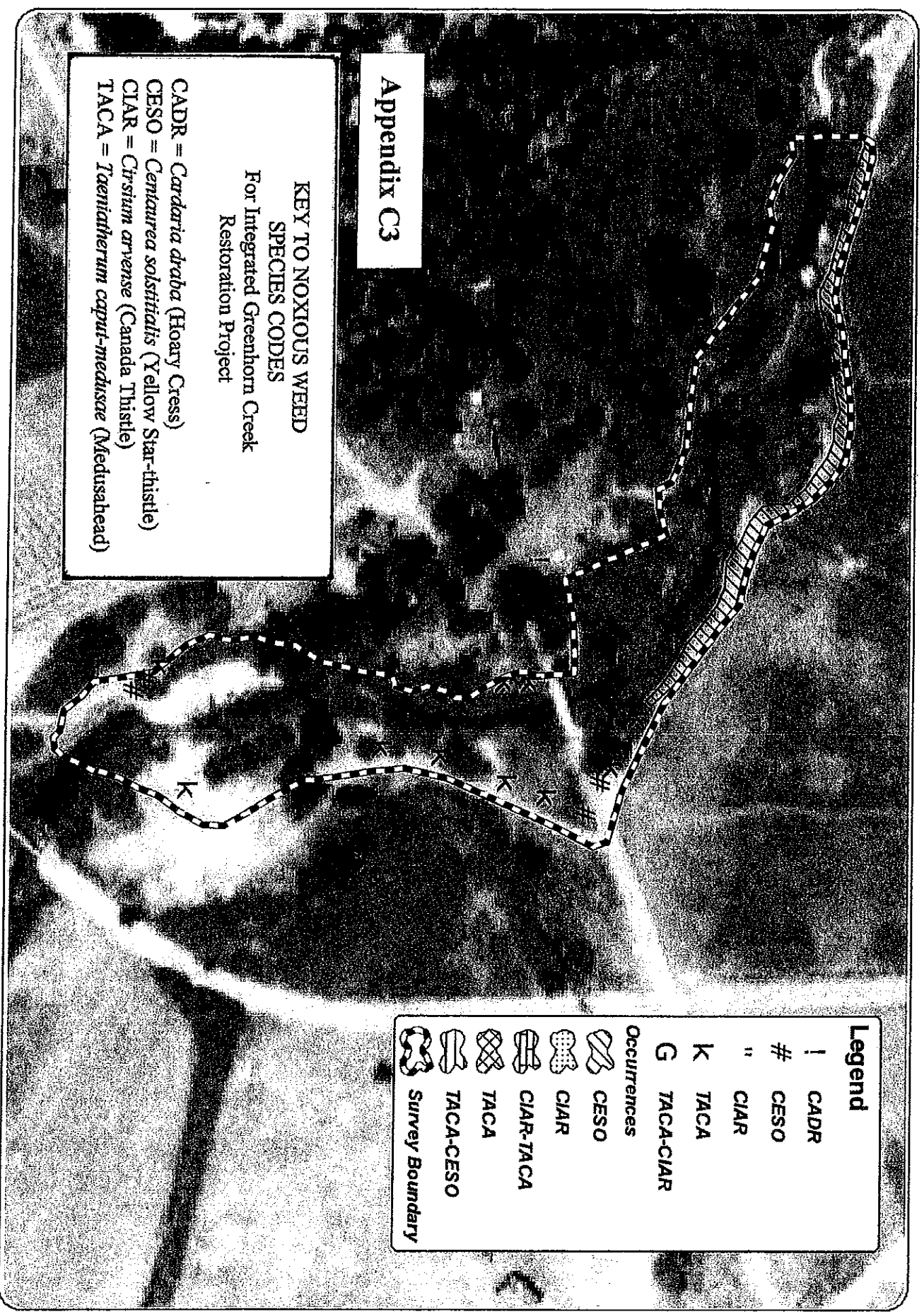


Greenhorn Creek Restoration  
Shea-Hansen 2

James Battaglin  
Butterfly Botanical Consultants

Compiled By: D.M. Churchill  
8/2/2010

711



# Appendix C3

KEY TO NOXIOUS WEED  
SPECIES CODES  
For Integrated Greenhorn Creek  
Restoration Project

CADR = *Cardaria draba* (Hoary Cress)  
CESO = *Centaurea solstitialis* (Yellow Star-thistle)  
CIAR = *Crusium arvense* (Canada Thistle)  
TACA = *Taenidherum caput-medusae* (Medusahed)

## Legend

- I CADR
  - # CESO
  - " CIAR
  - K TACA
  - G TACA-CIAR
- Occurrences
- CESO
  - CIAR
  - CIAR-TACA
  - TACA
  - TACA-CESO
  - Survey Boundary

0 37.575 150 225 300  
Feet  
Scale 1:1,800

Greenhorn Creek Restoration  
Carol Lane East Bridge

James Battaglin  
Butterfly Botanical Consultants

Compiled By D.M. Church  
8/22/10

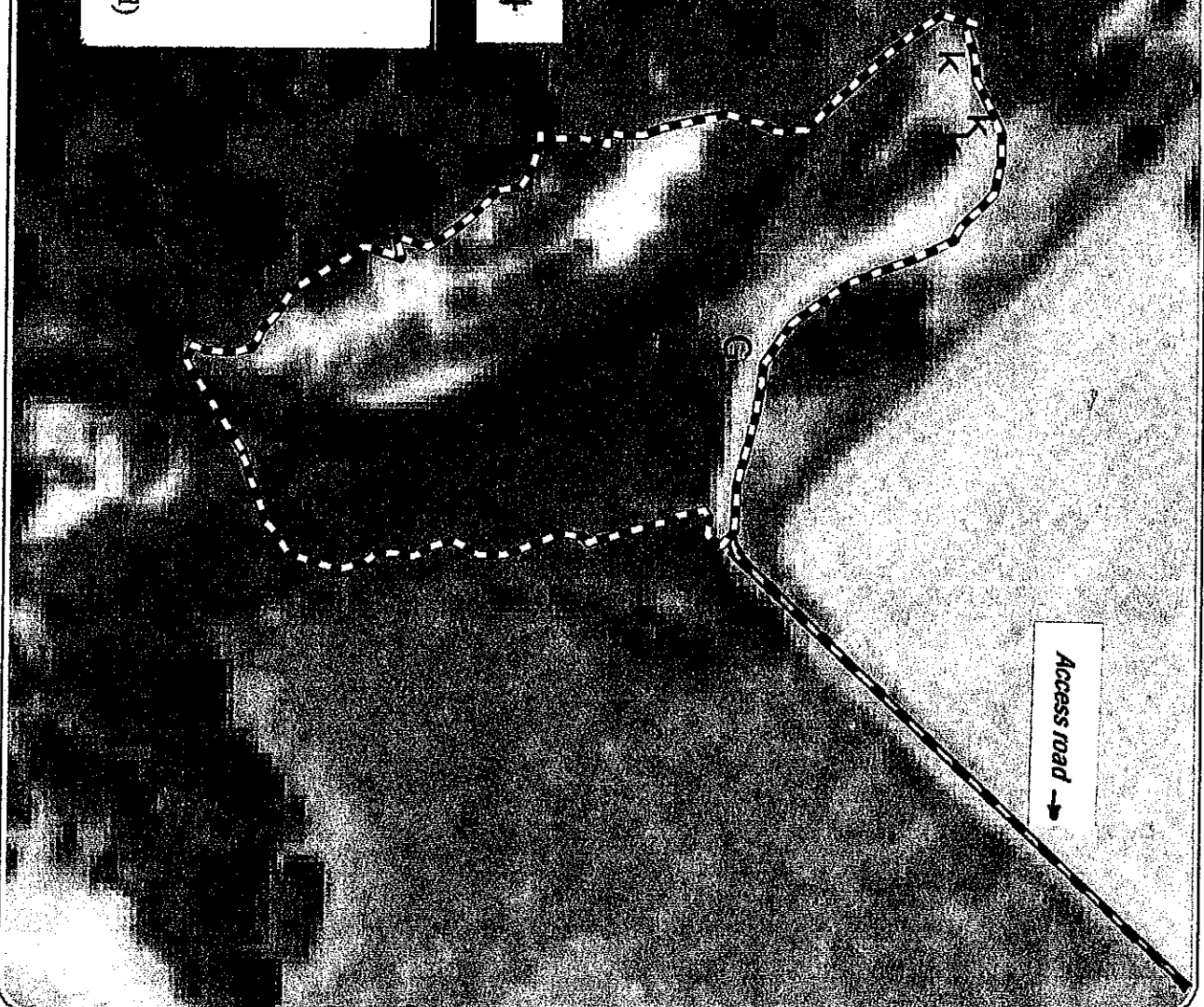
# Legend

- ! CADR
- # CESO
- " CIAR
- K TACA
- G TACA-CIAR
- Occurrences
- CEISO
- CIAR
- CIAR-TACA
- TACA
- TACA-CEISO
- Survey Boundary

## Appendix C4

### KEY TO NOXIOUS WEED SPECIES CODES For Integrated Greenhorn Creek Restoration Project

- CADR = *Cardaria draba* (Hoary Cress)
- CEISO = *Centurea solstitialis* (Yellow Star-thistle)
- CIAR = *Chrysium arvense* (Canada Thistle)
- TACA = *Taenicherum caput-medusae* (Medusahed)



Access road →

0 25 50 100 150 200  
Feet

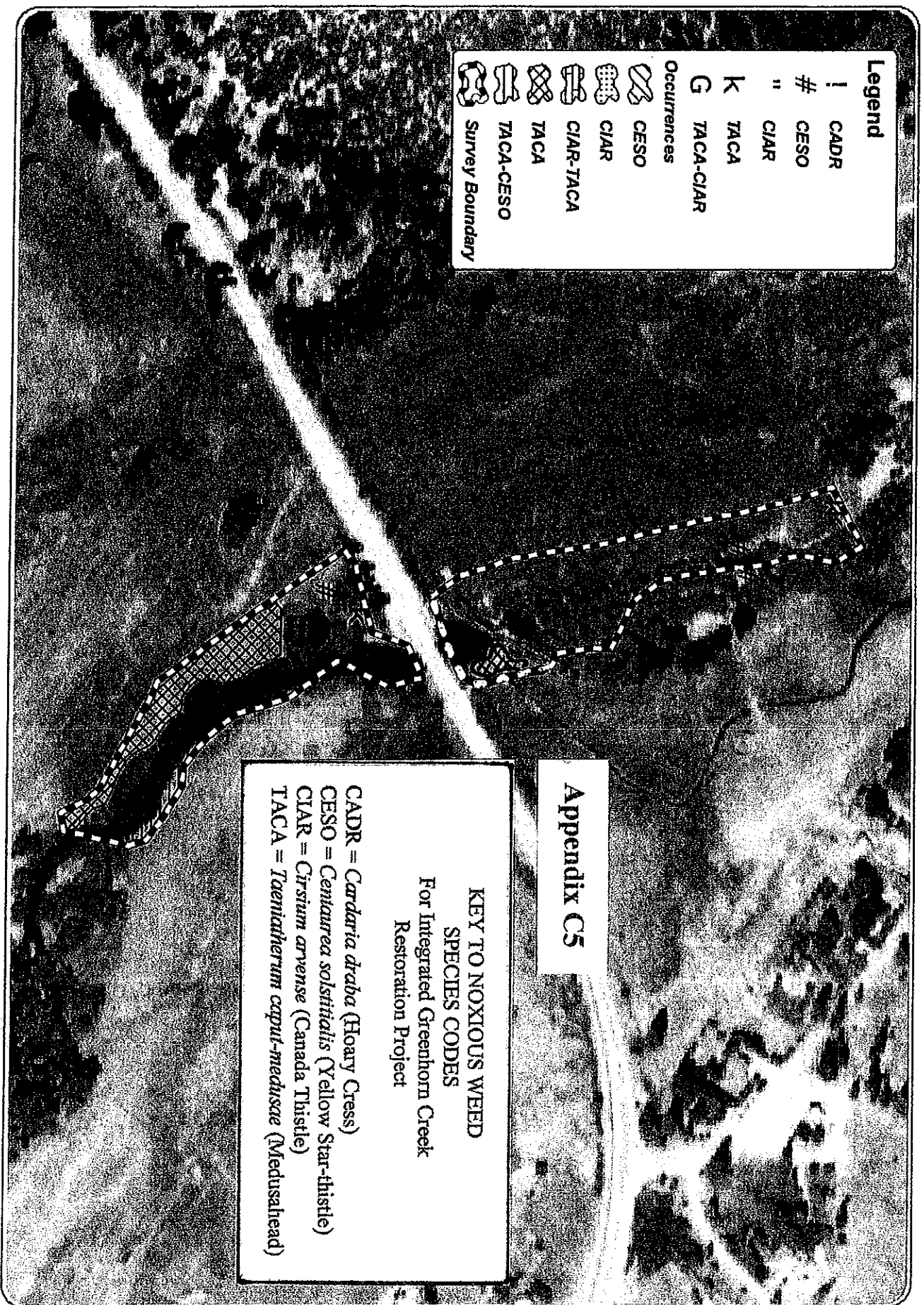
Scale 1:1,000

Greenhorn Creek Restoration  
Reid / PNF

James Battaglin  
Butterfly Botanical Consultants

Compiled By D.M. Churchill  
8/22/10





Greenhorn Creek Restoration  
Reid Dam / Scopwer

James Battogin  
Butterfly Botanical Consultants  
Compiled by D.M. Churchill  
8/22/10

## Appendix D

### BOTANICAL PREFIELD REVIEW INFORMATION

**Project Name:**

## INTEGRATED GREENHORN CREEK RESTORATION PROJECT

**USFS District:** Mt. Hough R.D., Plumas National Forest

**Reviewer:** Jim Battagin, Butterfly Botanical Consultants

**Title:** Botanical Consultant

**Date:** June 5, 2010

No known occurrences of species of concern are previously known from within the Proposed Project area.

Species of concern with known occurrences in the general vicinity of the Proposed Project area (information attained from the USFS, Mt. Hough Ranger District, Plumas National Forest and from the California Natural Diversity Database):

**Species**

**Rating**

*Lupinus dalesae*

Sensitive

*Pseudostellaria sierrae*

Special Interest, category 2

Other species of concern with potential to be within the Proposed Project boundaries:

**Species**

**Rating**

*Cypripedium montanum*

Sensitive

*Carex sheldonii*

Special Interest, category 2

*Orcuttia tenuis*

USFWS Threatened

## Appendix E

### BOTANICAL FIELD RECONNAISSANCE REPORT

## INTEGRATED GREENHORN CREEK RESTORATION PROJECT

**REPORTER:** Jim Battagin

**DATE:** June 30, 2010

**JOB TITLE:** Consultant Botanist

**F.S. DISTRICT:** Mt. Hough

**QUAD:** Quincy, CA. USFS map # 29. 589-2C. / Spring Garden, CA. USFS map # 30. 589-1C.

**LEGAL SUBDIVISION:** T24, R10, portions of sections 7, 8, 16, 17 and 21. See maps.

**LOCATION:** American Valley near Quincy, CA. Paralleling Chandler Road from Highway 70 on the south to Quincy Junction Road on the north.

#### RECONNAISSANCE:

**Date(s) of field work:** June 11-16, 2010.

**By:** Jim Battagin

**Number of acres surveyed:** Approx. 34 acres.

**The following type of reconnaissance was conducted in the project area:**

Cursory: \_\_\_\_\_ General: \_\_\_\_\_ Complete:  X  Intuitive controlled:  X

**The reconnaissance was conducted in the following manner:** The entire project area was viewed from various distances. Areas that were thought to be potential habitat for target species were viewed more closely.

**The area indicated on the attached map was surveyed for the following species of concern as determined by the Botanical Prefield Review Information:**

*Carex sheldonii*, (Sheldon's Sedge), *Lupinus dalesae* (Quincy Lupine) and *Pseudostellaria sierrae* (Sierra Starwort), and *Cypripedium montanum* (Mountain Lady's Slipper).

**Following the botanical survey, only the below listed species may have had potential habitat within the survey area although none was positively identified:**

**Sensitive Plant Species:** None.

**Report occurrences (Category 2):** *Carex sheldonii*.

**Species located:** None.

**Unoccupied habitat located:** No unoccupied habitat was positively identified. However, possible marginal habitat may have existed.

#### **HABITAT TYPES INVESTIGATED:**

**HABITAT TYPE 1:** Degraded creek channel.

**Habitat description 1:** Incised perennial stream channel. Gravel, rubble and cobble bars are occasional. Some unstable banks and channels mostly with alder and willow in various successional states.

**HABITAT TYPE 2:** Mostly pine forest.

**Habitat description 2:** Ponderosa Pine forest areas adjacent to the creek, fair plant diversity and a mostly continuous plant cover.

**HABITAT TYPE 3:** Grazed and ungrazed meadow.

**Habitat description 3:** Heavily grazed, compacted, and de-watered meadows. Consists almost entirely of introduced plant species with a high incidence of noxious weeds.

**Appendix F**  
**PLANT SPECIES LIST AND INFORMATION**  
**INTEGRATED GREENHORN CREEK RESTORATION**  
**PROJECT**

Date: June 20, 2010

Dates of field work: June 11-16, 2010

**Note:** Introduced plant species are typed in **bold** print.

**TREES:**

<i>Alnus rhombifolia</i>	White Alder
<i>Calocedrus decurrens</i>	Incense Cedar
<i>Pinus ponderosa</i>	Ponderosa Pine
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	Black Cottonwood
<i>Quercus kelloggii</i>	California Black Oak
<i>Salix laevigata</i>	Red Willow

**SHRUBS:**

<i>Ceanothus integerrimus</i>	Deer Brush
<i>Cornus sericea</i> var. <i>sericea</i>	Creek Dogwood
<i>Mahonia aquifolium</i>	Hollyleaf Oregon-grape
<i>Prunus virginiana</i>	Western Chokecherry
<i>Ribes nevadense</i>	Sierra Current
<i>Rubus leucodermis</i>	Western Raspberry
<i>Rosa woodsii</i>	Interior Wildrose
<i>Salix exigua</i>	Narrow-leaved Willow
<i>Salix lemmonii</i>	Lemmon's Willow
<i>Salix lucida</i> ssp. <i>lasianдра</i>	Shining Willow
<i>Spiraea douglasii</i>	Meadow Sweet
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	Common Snowberry

## GRASSES AND GRAMINIDS:

Achnatherum lemmonii  
 Alopecurus aequalis  
**Alopecurus pratensis**  
 Arrhenatherum elatius  
**Avena fatua**  
 Bromus carinatus  
**Bromus hordeaceus**  
**Bromus japonicus**  
**Bromus rigidus**  
**Bromus madritensis var. rubens**  
**Bromus tectorum**  
 Carex amplifolia  
 Carex angustata  
 Carex athrostachya  
 Carex feta  
 Carex lanuginosa  
 Carex nudata  
 Carex pachystachya  
 Carex stipata var. stipata  
 Carex subfusca  
 Carex utriculata  
**Dactylis glomerata**  
 Deschampsia danthonoides  
 Deschampsia elongata  
 Eleocharis parishii  
 Elymus glaucus ssp. glaucus  
 Elymus trachycaulus  
**Festuca pratensis**  
**Holcus lanatus**  
**Hordeum leporinum (murinum)**  
 Juncus bufonius var. bufonius  
 Juncus covellii var. obtusatus  
 Juncus effuses var. effusus  
 Juncus ensifolius  
 Juncus macrandrus  
 Juncus tenuis var. tenuis  
**Lolium perenne**  
 Melica geyeri  
 Phalaris arundinaceae  
**Phleum pratense**

Lemmon's Needlegrass  
 Little Meadow Foxtail  
**Meadow Foxtail**  
**Tall Oatgrass**  
**Wild Oats**  
 California Brome  
**Soft Chess (*Bromus mollis* – Clifton)**  
**Japanese Chess**  
**Ripgut Brome**  
**Foxtail Brome**  
**Cheatgrass**  
 Large-leaved Sedge  
 Well-fruited Sedge  
 Slender-beaked Sedge  
 Green-sheathed Sedge  
 Woolly Sedge  
 Torrent Sedge  
 Thick-headed Sedge  
 Awl-fruited Sedge  
 Sierra Slender Sedge  
 Beaked Sedge  
**Orchard Grass**  
 Annual Hairgrass  
 Slender Hairgrass  
 Parish's Spike-rush  
 Blue Wildrye  
 Slender Wheatgrass  
**Meadow Fescue**  
**Velvet Grass**  
**Hare Barley**  
 Common Toad Rush  
 Coville's Rush  
 Common Pacific Rush  
 Swordleaf Rush  
 Long-anthered Rush  
 Slender or Poverty Rush  
**English Rye Grass**  
 Geyer's Onion Grass  
 Tall Reedgrass  
**Common Timothy**

**Poa bulbosa**  
**Poa pratensis**  
*Scirpus microcarpus*  
**Taeniatherum (Elymus) caput-medusae**  
**Triticum aestivum**  
**Vulpia myuros var. myuros**

**Bulbous Bluegrass**  
**Kentucky Bluegrass**  
 Small-fruited Bulrush  
**Medusa-head**  
**Wheat**  
**Rattail Fescue**

# **ALL OTHER PLANTS:**

*Achillea millefolium*  
*Amsinckia intermedia*  
*Aquilegia formosa*  
*Artemisia douglasiana*  
**Brassica hirta**  
**Capsella bursa-pastoris**  
*Cardamine breweri*  
**Cardaria draba**  
**Centaurea cyanus**  
**Centaurea solstitialis**  
**Cerastium fontanum ssp. vulgare**  
**Chrysanthemum leucanthemum**  
**Cicorium intybus**  
*Cicuta douglasii*  
**Cirsium arvense**  
*Clarkia purpurea var. viminea*  
*Claytonia perfoliata*  
*Claytonia rubra*  
*Collomia grandiflora*  
**Convolvulus arvensis**  
*Crataegus douglasii*  
**Dipsacus fullonum**  
*Draba verna*  
*Epilobium brachycarpum*  
*Epilobium glaberrimum var. g.*  
*Epilobium lactuiflorum*  
*Eriogonum vimineum*  
*Equisetum arvense*  
*Equisetum hyemale*  
**Erodium cicutarium**  
*Eschscholzia californica*  
*Galium aparine*  
*Heracleum lanatum*

Common Yarrow  
 Rancher's Fiddleneck  
 Crimson Columbine  
 Mugwort  
**White Mustard**  
**Shepherds Purse**  
 Brewer's Bitter-cress  
**Heart-podded Hoary Cress**  
**Bachelor's Button**  
**Yellow Star-thistle**  
**Common Mouse-ear Chickweed**  
**Ox-eye Daisy**  
**Chicory**  
 Water Hemlock  
**Canada Thistle**  
 Four-spotted Clarkia  
 Miner's Lettuce  
 Red Miner's Lettuce  
 Large-flowered Collomia  
**Field Bindweed**  
 Douglas' Thorn-apple  
**Fuller's Teasel**  
 Belly Plant  
 Panicked Willow-herb  
 Glaucous Willow-herb  
 White-flowered Willow-herb  
 Wicker-stem Eriogonum  
 Common Horsetail  
 Common Scouring-rush  
**Red-stemmed filaree**  
 California Poppy  
 Cleavers, Goose-grass  
 Cow Parsnip

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**Hesperis matronalis**  
**Hypericum perforatum**  
**Lactuca serriola**  
**Lamium amplexicaule**  
 Lathyrus nevadensis  
 Lathyrus sulphurius  
**Lepidium campestre**  
**Lotus corniculatus**  
 Lotus oblongifolia  
 Lotus purshianus  
 Lupinus bicolor  
**Lychnis coronaria**  
**Lythrum hyssopifolia**  
 Madia gracilis  
**Matricaria matricarioides**  
**Medicago sativa**  
**Medicago lupulina**  
**Melilotus albus**  
**Mentha spicata**  
 Mimulus cardinalis  
 Mimulus guttatus  
**Myosotis scorpioides**  
 Myosotis discolor  
 Phacelia mutabilis  
**Plantago lanceolata**  
 Polygonum douglasii  
 Polygonum pennsylvanicum  
 Potentilla gracilis ssp. nuttallii  
 Prunella vulgaris ssp. lanceolata  
 Ranunculus aquatilis ssp. capillaceus  
 Ranunculus occidentalis  
 Ranunculus orthorhynchus  
 Ranunculus uncinatus  
 Rorippa curvisiliqua  
 Rorippa nasturtium-aquaticum  
**Rubus discolor**  
**Rubus laciniatus**  
**Rumex acetosella**  
**Rumex crispis**  
 Rumex salicifolia  
 Scutellaria bolanderi  
**Silene vulgaris**  
**Sinapis arvensis**

**Dame Rocket, Sweet Rocket**  
**Klamath Weed**  
**Prickly Lettuce**  
**Henbit**  
 Sierra Nevada Pea  
 Snub Pea  
**Common Peppergrass**  
**Birdsfoot Trefoil**  
 Oblong-leaved Lotus  
 Spanish Clover  
 Annual Lupine  
**Mullein Pink, Multeese Cross**  
**Hyssop Loosestrife**  
 Slender Tarweed  
**Pineapple Weed**  
**Alfalfa**  
**Black Medic**  
**White Sweet-clover**  
**Spearmint**  
 Scarlet Monkey-flower  
 Common Monkey-flower  
**Forget-me-not**  
 Yellow and Blue Scorpion-grass  
 Changeable Phacelia  
**Ribgrass**  
 Knotweed  
 Pennsylvania Persicaria  
 Slender Cinquefoil  
 Self-heal  
 Water Buttercup  
 Western Buttercup  
 Straight-beaked Buttercup  
 Uncinate-fruited Buttercup  
 Curve-fruited Yellow Cress  
 Water Cress  
**Himalaya-berry**  
**Cut-leaved Blackberry**  
**Sheep sorrel**  
**Curly Dock**  
 Willow Dock  
 Bolander's Skullcap  
**Inflated Campion**  
**Common Sinapis**



**Spergularia rubra**  
 Stachys ajugoides var. rigida  
**Tanacetum vulgare**  
**Taraxicum officinale**  
**Thlaspi arvense**  
**Tragopogon pratensis**  
**Trifolium dubium**  
**Trifolium hirtum**  
**Trifolium pratense**  
**Trifolium repens**  
 Typha latifolia  
**Valerianella locusta**  
**Verbascum thapsus**  
 Veronica americana  
 Veronica serpyllifolia ssp. humifusa  
 Vicia Americana

**Ruby Sandspurry**  
 Bugle Hedge Nettle  
**Common Tansy**  
**Common Dandelion**  
**Field Penny Cress**  
**Meadow Salsify, Goat's-beard**  
**Shamrock**  
**Rose Clover**  
**Red Clover**  
**White Clover**  
 Soft Flag, Cattail  
**Corn Salad**  
**Common Mullein**  
 American Speedwell  
 Thyme-leaved Speedwell  
 American Vetch

Total number of plant species: 155

Number of introduced species: 63

*The following plants were the most common plants found in the project area:*

**Bromus hordeaceus**  
**Hordeum leporinum (murinum)**  
 Phalaris arundinaceae  
**Vulpia myuros var. myuros**  
 Epilobium brachycarpum  
 Madia gracilis

**Soft Chess**  
**Hare Barley**  
 Tall Reedgrass  
**Rattail Fescue**  
 Panicked Willow-herb  
 Slender Tarweed

*The following plants were the least common in the project area (the least common being at the top of the list and there being no more than 10 plants of any species listed):*

Mahonia aquifolium  
 Achnatherum lemmonii  
**Avena fatua**  
 Melica geyeri  
**Cardaria draba**  
 Clarkia purpurea var. viminea  
 Crataegus douglasii  
 Mimulus cardinalis  
**Rubus laciniatus**  
**Thlaspi arvense**

Hollyleaf Oregon-grape  
 Lemmon's Needlegrass  
**Wild Oats**  
 Geyer's Onion Grass  
**Heart-podded Hoary Cress**  
 Four-spotted Clarkia  
 Douglas' Thorn-apple  
 Scarlet Monkey-flower  
**Cut-leaved Blackberry**  
**Field Penny Cress**

## **Appendix G**

### **Integrated Greenhorn Creek Restoration Project**

#### **Noxious Weed Risk Assessment**

**Prepared by:** /s/ Jim Battagin **Date:** 9-10-10  
Jim Battagin, Butterfly Botanical Consultants

## Noxious Weed Risk Assessment

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## INTRODUCTION

This Noxious Weed Risk Assessment has been prepared to evaluate the effect of a stream restoration project and adjacent ground disturbance for the Proposed Integrated Greenhorn Creek Restoration Project on California Department of Food and Agriculture (CDFA) listed noxious weeds and other invasive non-native plant species. This assessment is in compliance with the Plumas National Forest Land and Resource Management Plan (USDA Forest Service 1988), the Herger-Feinstein Quincy Library Group Forest Recovery Act Final Environmental Impact Statement (USDA Forest Service 1999), the Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement Record of Decision (USDA Forest Service 2001), Executive Order on Invasive Species (Executive Order 13112), and the direction in the Forest Service Manual section 2080, Noxious Weed Management (amendment effective since 11/29/95) (USDA Forest Service 1991), which includes a policy statement calling for a risk assessment for noxious weeds to be completed for every project. The overriding principle stated in these documents is that "...it is much cheaper to prevent an infestation from becoming established than to try to eliminate it once it has begun to spread, or deal with the effects of a degraded plant community." Specifically, the manual states: 2081.03 - Policy. When any ground disturbing action or activity is proposed, determine the risk of introducing or spreading noxious weeds associated with the proposed action.

1. For projects having moderate to high risk of introducing or spreading noxious weeds, the project decision document must identify noxious weed control measures that must be undertaken during project implementation.
2. Use contract and permit clauses to prevent the introduction or spread of noxious weeds by contractors and permittees. For example, where determined to be appropriate, use clauses requiring contractors or permittees to clean their equipment prior to entering National Forest System lands.

2081.2 - Prevention and Control Measures. Determine the factors that favor the establishment and spread of noxious weeds and design management practices or prescriptions to reduce the risk of infestation or spread of noxious weeds.

Where funds and other resources do not permit undertaking all desired measures, address and schedule noxious weed prevention and control in the following order:

1. First Priority: Prevent the introduction of new invaders,
2. Second Priority: Conduct early treatment of new infestations, and
3. Third Priority: Contain and control established infestations.

## Analysis Methods

### Surveys

Botanical surveys covering approximately 34 acres were conducted for the Area in the summer of 2010 for rare plants, special habitats, and noxious weeds by Jim Battagin of Butterfly Botanical Consultants.

The risk of noxious weed establishment takes into account a variety of factors:

1. Mapping of noxious weed species,
2. Size of existing known populations,
3. Treatment of known populations,
4. Standard Operating Procedures or Standard Management Requirements,

### Geographic Analysis Area:

The Integrated Greenhorn Creek Restoration Project area encompasses approximately 34 acres. The area of analysis for noxious weed risk assessment includes only the Proposed Project area.

### Timeframe:

No noxious weed records exist for the Project area.

## NON-PROPOSED ACTION DEPENDENT FACTORS

### INVENTORY

A complete noxious weed survey was conducted in the project analysis area by Jim Battagin of Butterfly Botanical Consultants

There are no recorded noxious weed species within the Project area boundary. Although the area of this survey does not include any areas outside the Project area, it is often helpful to be aware of any known locations near the Project area. In querying the Mount Hough District of the Plumas National Forest records, several locations of noxious weeds within 2 miles of the Project area were discovered, they are:

<i>Cirsium arvense</i> (Canada thistle)	1 location
<i>Centaurea solstitialis</i> (Yellow star-thistle)	20 locations
<i>Taeniatherum caput-medusae</i> (Medusahead)	18 locations

None of the above occurrences of noxious weeds are located in American Valley Proper, but are in close proximity on the hillsides surrounding the valley.

## SURVEY RESULTS

The California Department of Food and Agriculture's noxious weed list (<http://www.cdffa.ca.gov>) divides noxious weeds into categories A, B, and C. A-listed weeds are those for which eradication or containment is required at the state or county level. With B-listed weeds, eradication or containment is at the discretion of the County Agricultural Commissioner. C-listed weeds require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner.

There are no known occurrences of A-listed weed species in the analysis area. However, there is one species on the B list and two species on the C list:

**A-listed weeds: eradication or containment is required at the state or county level**

None are known to be present.

**B-listed weeds: eradication or containment is at the discretion of the County Agricultural Commissioner**

*Cirsium arvense* is a B-listed weed and was found within the Proposed Project area. The plant locations are generally spotted throughout the entire project area and will more than likely be unavoidable during Project implementation. See maps.

**C-listed weeds: require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner**

*Centaurea solstitialis* and *Taeniatherum caput-medusae* are C-listed weeds and were found within the Proposed Project area. The plant locations are generally spotted throughout the entire project area and will more than likely be unavoidable during Project implementation. See maps.

*Note: In addition, one occurrence of Cardaria draba (Hoary Cress), a B-listed noxious weed was discovered immediately adjacent to the Carol Lane East Bridge portion of the project (see map for location). This noxious weed has been reported to the office of the Plumas County Agricultural Commissioner (specifically to Tim Gibson) for consideration for eradication when it flowers again in June of 2011.*

Overall, risk of noxious weed expansion from existing occurrences within the Project area is high.

## **HABITAT VULNERABILITY**

Vulnerability to noxious weed invasion and establishment is greatly influenced by plant cover, soil cover, noxious weed seed source and over-story shade. These factors vary across the project area. Other areas of risk in this proposed project area are those located next to roads. Roads provide dispersal of exotic species via three mechanisms: providing habitat by altering conditions, making invasion more likely by stressing or removing native species, and allowing easier movement by wild or human vectors. These factors contribute to a high risk of noxious weed invasion.

## **NON-PROJECT DEPENDENT VECTORS**

Many vectors exist for the dissemination of noxious weed seed. A few of these might be cattle, birds, wind, water and various motor vehicles such as ATV's, farm trucks and motorcycles

## **PROPOSED ACTION DEPENDENT FACTORS**

The greatest risk of infection in this stream restoration project is probably at the time of construction and the consequent possible introduction of weed seed from areas already infected within the Project area to newly disturbed soil. Even if this threat is properly dealt with (see "Standard Operating Procedures" below), there is a high probability of spreading weed seed due to the many areas of noxious weeds already present in many parts of the Proposed Project area.

## **HABITAT ALTERATION EXPECTED AS A RESULT OF PROJECT**

The purpose of the Proposed Action is to restore and/or strengthen portions of streambank along Greenhorn Creek in order to improve water quality and riparian habitat and to prevent accelerated bank erosion. Existing vertical banks with no current vegetation will be sloped to a point where vegetation will be able to become established. The stabilizing influence of the vegetated banks is the main purpose of the Proposed Project.

## INCREASED VECTORS AS A RESULT OF PROJECT IMPLEMENTATION

Vehicles, personnel, and earth moving equipment are all vectors that can carry noxious weed seed and/or plant parts into and/or around the area during construction. Equipment washing, as explained below, will help to reduce the risk of inter-project transfer and of introducing new species of noxious weeds from outside the Project area. Vectors should decrease as known noxious weed populations are designated on the ground. After construction, there would be no additional vectors than currently exist.

## MANAGEMENT MITIGATIONS

As outlined above, there are many areas within the Proposed Project area that house noxious weeds. Since none are A-listed, it is not required by law to eradicate them. However, they still have a deleterious effect on the native vegetation, wild animals and farm animals. Without eradication prior to project implementation, some amount of spread of these noxious weeds is virtually assured. On the other hand, the complete eradication of these same weeds is almost humanly impossible.

Since this restoration project is an important one to the health of Greenhorn Creek, it would seem prudent to try to proceed with it while still paying close attention to minimizing the spread and/or introduction of additional noxious weeds. This reporter recommends that areas with noxious weeds be well-marked so that:

1. Treatment of known areas of noxious weeds in areas that may be accessed or disturbed by project activities prior to construction will reduce the noxious weed seed produced.
2. Whenever possible, people and equipment can be kept out of these areas. Weed areas should be flagged for easy avoidance.
3. Upon project completion, these areas, and all disturbed ground, are sown with appropriate native and non-native grasses at the proper time of year as established by a professional botanist or someone in that field of work. Appropriate species to use include:

<i>Agrostis stolonifera</i>	Introduced*	moist to wet
<i>Deschampsia cespitosa</i>	Native	moist to wet
<i>Elymus glaucus</i>	Native	upland
<i>Elymus triticoides</i>	Native	moist/vernal
<i>Festuca rubra</i>	Native	upland to moist
<i>Hordeum brachyantherum</i>	Native	moist to wet
<i>Phleum pretense</i>	Introduced*	moist to wet



*Poa pratensis*

Introduced\*

upland to moist

\*Introduced plants would only be used at the discretion of the Mt Hough District Botanist during the season of collection and sowing.

(If seeds cannot be locally collected, they can be ordered from Comstock Seed (775-265-0090), and should be ordered also from at least one other source to ensure genetic diversity. Seeds should be sown as soon as possible after ground disturbance is complete, ideally in the fall of the year.)

4. Following project implementation and subsequent seeding, disturbed areas can be monitored for 3 years in an attempt to determine the success of the seeding effort and level of infestation of noxious weeds. It may be determined during that time if a weeding effort is feasible or desired.

5. Construction logistics can be planned to avoid spreading weeds from one treatment area to another.

## STANDARD OPERATING PROCEDURES (SOP)

The SOP are based on the priorities established in FSM 2081.2 which states “where funds and other resources do not permit undertaking all desired measures, address and schedule noxious weed prevention and control in the following order:

1. First Priority: Prevent the introduction of new invaders,
2. Second Priority: Conduct early treatment of new infestations, and
3. Third Priority: Contain and control established infestations.”

1. Prevention/Cleaning: Require all off-road equipment and vehicles (Forest Service and contracted) used for project implementation to be weed-free. Clean all equipment and vehicles of all attached mud, dirt and plant parts. This will be done at a vehicle washing station or steam cleaning facility before the equipment and vehicles enter the project area. Cleaning is not required for vehicles that will stay on the roadway. Also, all off-road equipment must be cleaned prior to leaving areas infested with noxious weeds.

2. Prevention/Road Construction, Reconstruction, and Maintenance: All earth-moving equipment, gravel, fill, or other materials need to be weed free. Use onsite sand, gravel, rock or organic matter where possible.

3. Prevention/Revegetation: Use weed-free equipment, mulches, and seed sources. Avoid seeding in areas where revegetation will occur naturally, unless noxious weeds are a concern. Save topsoil from disturbance and put it back to use in onsite revegetation, unless contaminated with noxious weeds. All activities that require seeding or planting will need to use only locally collected native seed sources or other appropriate species. Plant and seed material should be collected from as

close to the project area as possible, from within the same watershed and at a similar elevation whenever possible. Persistent non-natives such as timothy, orchard grass, or ryegrass will be avoided (but considered). This will implement the USFS Region 5 policy that directs the use of native plant material for revegetation and restoration for maintaining “the overall national goal of conserving the biodiversity, health, productivity, and sustainable use of forest, rangeland, and aquatic ecosystems”.

4. Prevention/Staging Areas: Do not stage equipment, materials, or crews in noxious weed infested areas where there is a risk of spread to areas of low infestation.

5. Infestations will be treated (in this case, by seeding in areas with noxious weeds that were disturbed).

## ANTICIPATED WEED RESPONSE TO PROPOSED ACTION

Table 2. Anticipated Weed Response

Factors	Variation	Risk
<b>NON-PROPOSED ACTION DEPENDENT FACTORS</b>		
1. Inventory	Complete	Low
2. Known Noxious Weeds	3 species, One B and two C	N/A
3. Habitat vulnerability	High cover, Low to moderate disturbance	Low current vulnerability
4. Non-project dependent vectors	Moderate current vectors	Low to moderate current vulnerability
<b>PROPOSED ACTION DEPENDENT FACTORS</b>		
5. Habitat alteration expected as a result of project.	Intensive ground disturbance in limited areas	High
6. Increased vectors as a result of project implementation	Vehicles, personnel, and equipment; equipment cleaned per SOP	High
7. Mitigation measures	No SOP measures or mitigations implemented	High
	Some SOP measures implemented	High
	All SOP measures implemented	Probably moderate
8. Anticipated weed response to proposed action	Some or no SOP measures implemented	High potential for significant increase in weed spread as a result of project implementation
	All SOP measures implemented	Moderate potential for weed spread as a result of project implementation

9. Cost estimates	Purchase and dissemination of seed is estimated at about \$2400. For 3 yrs after project: Mapping, monitoring, and control are expected to take 2 people, 2 days/year @ \$200 per day per person for a total of \$800 for one year and \$2400 for the 3 years.	This money would allow grass seeding and monitoring for 3 years. Pre-project data in areas that are positively determined to be disturbed would be very helpful in determining the effect of seeding these areas.
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## COSTS

Noxious weeds significantly reduce the value of all lands. Noxious weeds negatively impact timber production, grazing, wildlife habitat, and recreational opportunities. Furthermore, noxious weed control is expensive and time consuming. Prevention and control of small infestations can reduce these impacts and reduce expenditures in the long run. Thus, noxious weed surveys, control of small infestations, and prevention measures are vital in reducing overall impacts and costs from noxious weeds. Cost estimates are listed above.

## SUMMARY

There are three noxious weed species located in the analysis area and some of the occurrences are quite extensive. The implementation of the Integrated Greenhorn Creek Restoration Project is predicted to result in a low to moderate potential for weed introduction and spread if all SOP (Standard Operating Procedures) and mitigations (see MANAGEMENT MITIGATIONS on Page 6 above) are adopted. If no noxious weed SOP or mitigations are incorporated into the project it is likely that the introduction and spread of noxious weeds would be high. This determination is based on the following:

1. The large number of known occurrences.
2. Clear mapping and flagging of noxious weed occurrences.
3. Implementation of SOP's and mitigations.
4. Monitoring and treatment of disturbed areas for 3 years after project implementation.

## NOTICE OF DETERMINATION

TO: Plumas County Clerk  
520 Main Street, Room 104  
Quincy, CA 95971

FROM: Plumas County  
Building & Planning Services  
555 Main Street  
Quincy, CA 95971

**Subject:** Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

**Project Title:** Integrated Greenhorn Creek Restoration Project

State Clearinghouse Number  
2011062025

Contact Person:  
Jim Graham

Phone Number  
(530) 283-7011

**Project Location:** Along Greenhorn Creek near Chandler Road. T 24N, R 10E, Sections 7, 8, 16, 17 & 21 in Plumas County.

**Project Description:** This project involves the treatment of 21 acres channel and riparian area in six discrete units along Greenhorn Creek using bank sloping, boulder vanes, and fish passage structures.

This to advise that the Plumas County Planning and Building Services has approved the above-described project and has made the following determinations regarding the above-described project:

The project will not have a significant effect on the environment.

Negative Declaration #658 was prepared for this project pursuant to the provisions of CEQA. The Negative Declaration and record of project approval may be examined at: Plumas County Building & Planning Services - 555 Main Street, Quincy, CA

Mitigation measures were made a condition of project approval. The project will not, as mitigated, have a significant effect on the environment.

Date Filed

7/14/11

Randy Wilson

Randy Wilson  
Planning Director

By

Kathleen Williams

KATHLEEN WILLIAMS County Clerk/Deputy

### Certificate of Posting

I hereby certify that from 7/14/11 to 8/13/11 I posted a copy of this Notice of Determination in the office of the Plumas County Clerk (30 days).

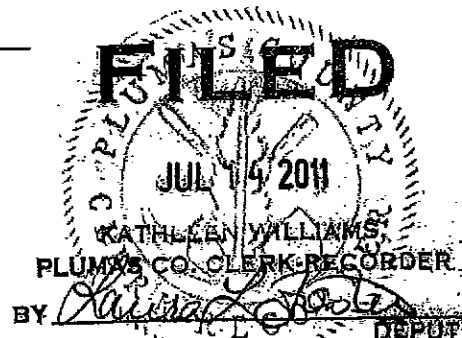
By

Kathleen Williams

Kathleen Williams, County Clerk /Deputy

on

7/14/2011



receipt # 412669

Doc # 2011-19

# **Decision Notice & Finding of No Significant Impact**

## **Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project Environmental Assessment**

### **USDA Forest Service, Plumas National Forest, Mt. Hough Ranger District, Plumas County, California**

#### **Introduction**

The Reid/Plumas National Forest (PNF) Treatment Unit of the Integrated Greenhorn Creek Restoration Project area is located in American Valley near Quincy, in Plumas County, California. One acre is administered by the Mt. Hough Ranger District, Plumas National Forest and 0.2 acres of private land, owned by Russell and Elizabeth Reid (Figure 1), in the Greenhorn Creek watershed, in the Plumas National Forest Land and Resource Management Plan (PNF LRMP) Grizzly Ridge Management Area. The project area is in T.24N, R.10E, section 17, MDBM.

The objective of the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project Environmental Assessment (EA) is to consider and disclose the environmental effects of the Proposed Action, and the alternatives to the Proposed Action, in compliance with the National Environmental Policy Act (NEPA). The purpose of the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project is to eliminate excessive erosion of the stream bank and this source of sediment into Greenhorn Creek. The Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project Environmental Assessment documents the analysis of two alternatives to meet this need.

The project Proposed Action would lay back the eroding bank, so that stabilizing vegetation can become established, and would direct the majority of stream flow into the center of the channel with the installation of seven boulder vane structures. The boulder vanes would concentrate erosive energy into the maintenance of pool depth, rather than lateral gully expansion. This Proposed Action is consistent with direction for restoration and management of riparian zones in the Herger-Feinstein Quincy Library Group Forest Recovery Act.

#### **Applicable Management Direction**

The Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project is proposed to respond to the goals and objectives of the Plumas National Forest Land and Resource Management Plan (PNF LRMP)(USFS PNF 1988) as amended by the Herger-Feinstein Quincy Library Group (HFQLG) Final Supplemental Environmental Impact Statement (FSEIS) and Record of Decision (ROD) (USFS 1999, USFS 2003), and the Sierra Nevada Forest Plan Amendment (Framework) FSEIS and ROD (USFS PSW 2004a, 2004b, 2004c); the HFQLG FSEIS, which directs forest management and watershed restoration activities within portions of the Plumas National Forest, and requires the Plumas National Forest to adopt Riparian Management Direction, commonly referred to as the Scientific Analysis Team (SAT) Guidelines.

## **Purpose and Need:**

The purpose of this initiative is to reduce on-going excessive erosion along 390 feet of stream bank on Greenhorn Creek. This action is needed because the stream bank in the Reid/PNF Treatment Unit is vertical, raw, and actively eroding. The erosion contributes sediment to the channel, resulting in diminished trout habitat and water quality. Without intervention, the bank would continue to recede until an adequate floodplain width is achieved at the incised channel elevation. Implementation of the project would include laying back and vegetating the eroding bank, thus allow stabilizing vegetation to take hold and grow. The boulder vanes would concentrate erosive energy into the maintenance of pool depth, rather than lateral gully expansion. The desired condition is a well-vegetated and stable stream bank that provides shade to the stream channel and habitat to trout.

## **Decision and Rationale for the Decision**

### **Decision**

I have decided to implement the Proposed Action alternative as described in the EA (pp 6-7). This alternative best meets the purpose and need of the project. I am in favor of this project because it addresses a degraded area of the District, and will benefit numerous resources in the long term by stabilizing an actively eroding stream bank. Through the NEPA process, and the collaborative Coordinated Resource Management process, the project Interdisciplinary Team and the public developed a project that would benefit the most resources with the least impact. My decision to implement this project is based on the Purpose and Need of the project, and the analysis of impacts that the project will have on resources and the environment as detailed in the EA.

### **Rationale for Decision**

In reaching my decision, I have considered the purpose and need for action, the issues, the range of alternatives and environmental consequences as described in the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project Environmental Assessment, the associated project record, supporting materials referenced by the EA, and comments from the public on the scoping packet and the EA. This project was designed to ensure protection of resources from significant impacts through implementation of design standards, Best Management Practices (BMPs), and monitoring.

In reviewing the EA, I concur with the analysis of the project and understand the environmental effects disclosed therein. My conclusions are based on a thorough review of the best available science, consideration of responsible opposing views, the acknowledgement of scientific uncertainty, and risk.

### ***Reasons Related to Purpose and Need***

The Proposed Action best meets the Purpose and Need for action, which is to provide “a program of riparian management, including wide protection zones and riparian restoration.” In addition, it addresses the direction in the Environmental Impact Statement for the Herger-Feinstein Quincy Library Group Forest Recovery Act that riparian areas should be managed to sustain “healthy aquatic and riparian ecosystems protected from the impacts of land use activities, but able to adjust to impacts caused by natural-occurring disturbance processes such as wildfire, flood, and drought. Streams and their riparian areas would be restored to their proper functioning condition.”

This action is also consistent with the direction for riparian management described in the *Sierra Nevada Forest Plan Amendment, Final Supplemental Environmental Impact Statement*, Appendix A (Management Direction and Management Goals and Strategies: Aquatic, Riparian, and Meadow Ecosystems and Associated Species) to “maintain and restore water quality, floodplains and water tables, watershed connectivity, watershed condition, streamflow patterns and sediment regimes, streambanks and shorelines.”

This project is expected to reduce erosion and sedimentation; and improve fishery, riparian, and riparian dependent wildlife habitat; vegetative cover, and water quality. These expected results are complementary to the Plumas National Forest Land and Resource Management Plan (PNF LRMP), as amended.

## Alternatives Considered In Detail, But Not Selected

### No Action Alternative

Under this alternative, the Forest Service would not implement the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project. Bank erosion would continue, increasing the loss of riparian habitat and sedimentation in the channel. The project area would remain in its current condition and current management plans would continue to guide management of the project area. The funded opportunity to improve bank stability would not be considered further. The existing conditions in the project area that are described in the EA as the “need” for the project (i.e. bank erosion, diminished trout habitat and water quality) would not be addressed. Because the Purpose and Need of the project would not be addressed under this alternative, it was not chosen.

### Public Involvement

As additional interested parties identified themselves, 14 additional scoping packages were mailed during the scoping period, on March 11, 2011. Four comments were received: one letter to the District, two emails and a phone call to Leslie Mink at Plumas Corporation.

A notice of the Proposed Action (PA) first appeared in the Plumas National Forest quarterly Schedule of Proposed Actions (SOPA) issued in September 2010 and has been updated in the SOPA each quarter since. The Mt. Hough Ranger District started the NEPA scoping process with publication of the legal notice of the PA in the *Feather River Bulletin* on March 2, 2011. Proposed Action description packets (PA, figures, and maps) were sent to various individuals, organizations, government agencies, and tribes. The scoping period ended on April 4, 2011.

The purpose of the scoping process was to inform the public about the Purpose and Need for the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project and the PA. The scoping comments were used by the Interdisciplinary Team (IDT) to identify project issues, potential alternatives, and information that should be presented in the Red Clover Poco Restoration Project EA. Four comments on the project were received.

The 30-day public comment and review of the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project EA began with the publication of the legal notice in the official newspaper of record, *Feather River Bulletin*, on June 8, 2011. In addition to the publication of the legal notice, the

Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project EA was sent to various interested agencies, individuals, organizations and tribes. No comments were received during the 30-day comment period.

## Finding of No Significant Impact

In finding that the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project has no significant impact, I looked at the project's effects, both in context and in intensity. I have looked at the action in several contexts such as the affected region, affected interests, and the locality. I have addressed the intensity of the project and the extent of its impact. Taking both into consideration, and in accordance with 40 CFR §1508.27, I have determined that there are no significant impacts based upon the following:

1. My finding of no significant environmental effects is not biased by the beneficial effects of the action. As discussed below, when potential adverse impacts are considered, wholly apart from other beneficial impacts of the action, no significant impacts are expected.
2. Based on my review of the EA and project record, and similar work previously completed on this District, public health and safety should not be adversely affected. Activities of the Proposed Action, including channel work and revegetation, and fencing, are designed to protect public health and safety.
3. There are no known impacts to unique characteristics of the area. There are no parklands in or near the project area and riparian habitat would be improved. The project will meet the Riparian Management Objectives outlined in the HFQLGFRA Environmental Impact Statement.
4. The effects are not likely to be highly controversial. The project design was developed and reviewed by resource professionals experienced in the techniques to be applied. During the public scoping process, no comments were received that identified "significant" issues as defined by the National Environmental Policy Act (NEPA).
5. The Mt. Hough Ranger District has considerable experience with actions like the one proposed. The analysis shows the effects are not uncertain, and do not involve unique or unknown risk. Similar projects have been successfully implemented in four stream channels in the Feather River watershed over the past 20 years (Greenhorn Creek, Wolf Creek, Spanish Creek, and Little Last Chance Creek). These projects are performing as designed and functioning as predicted. The effects of these activities can be reasonably estimated, and are detailed in the EA.
6. The action is not likely to establish a precedent for future actions with significant effects. Nor will they represent a decision in principle about a future consideration. This decision does not, of itself, set a precedent for future actions. Each treatment and treatment area is separate. Any future actions would be analyzed separately, using all the information available at that time, in compliance with NEPA.



7. This restoration project does not present significant cumulative adverse effects when considered in combination with other past or reasonably foreseeable actions. This proposed project was analyzed in the context of other activities in the watershed (i.e. current and past agricultural activities, and past and proposed stream restoration), and its effects on fish and wildlife, sensitive plants, weeds, grazing, hydrology, and soils. The effect of this project on these resources is cumulatively beneficial.
  - **Wildlife** — This project does not present significant cumulative adverse effects to wildlife within the Wildlife Analysis Area. The direct effects of the project on wildlife species are minimal, and will not result in significant cumulative impacts to such species even when added to past, present, and reasonably foreseeable actions in the area.
  - **Watersheds** — Cumulative impacts to the watershed surrounding the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project area are not expected to significantly increase compared to existing conditions. Design standards were developed to reduce or eliminate impacts and are incorporated as an integrated part of the Proposed Action alternative. The design criteria are based upon standard practices, such as best management practices (BMPs) that have proven to be effective under similar circumstances and conditions.
8. The action will have no significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, because such resources do not occur in or near the project area, therefore there would be no effect on cultural resources.
9. The Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project will not adversely affect any endangered or threatened species or critical habitat under the Endangered Species Act of 1973 because there are no such plant or animal species in or near the project area.
10. This action does not threaten a violation of any federal, state or local laws that protect the environment. The project is consistent with the Plumas National Forest Land and Resource Management Plan (1988), as amended by the Herger-Feinstein Quincy Library Group Forest Recovery Act Record of Decision (HFQLGFRA ROD), and the Sierra Nevada Forest Plan Amendment (SNFPA ROD); and the National Forest Management Act of 1976 (EA p.57).

## Findings Required by Other Laws and Regulations

In addition to the FONSI, I find that this project is consistent with the Land and Resource Management Plan for the Plumas National Forest (1988) as amended. Therefore, this project is consistent with the requirements of the National Forest Management Act of 1976. In addition, the Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project complies with the Endangered Species Act, Clean Air Act, Clean Water Act, and other federal, state, and local laws or requirements imposed for the protection of the environment.

## Implementation Date

Implementation of the project is expected in September or October of 2011, or 2012, depending on funding.

## Administrative Review or Appeal Opportunities

This decision is not subject to appeal by individuals or organizations.

*/s/ Katherine Carpenter*

08/29/2011

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KATHERINE CARPENTER

Date

Acting District Ranger

Mt. Hough Ranger District

Plumas National Forest

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United States  
Department of  
Agriculture

Forest  
Service

May 2011



# Environmental Assessment

## Reid/PNF Treatment Unit of the Integrated Greenhorn Creek Restoration Project

**Mt. Hough Ranger District, Plumas National Forest  
Plumas County, California**

T.24N., R10E., Section 17

For Information Contact: Kelby Gardiner  
39696 Hwy 70, Quincy, CA 95971 (530) 283-7686

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## **SUMMARY**

The Plumas National Forest, in partnership with the private land owner and the Feather River Coordinated Resource Management Group, proposes to stabilize 390 feet of stream bank along Greenhorn Creek. The 1.2 acre project area is located in American Valley near Quincy, in Plumas County, California, on one acre administered by the Mt Hough Ranger District, Plumas National Forest and 0.2 acres of private land, owned by Russell and Elizabeth Reid. This action is needed because the actively eroding vertical bank is contributing sediment to the stream channel, thus degrading cold water fish habitat and water quality. Without intervention, the bank would continue to recede until an adequate floodplain width is achieved at the incised channel elevation.

The Proposed Action would lay back the eroding bank, so that stabilizing vegetation can become established, and would direct the majority of stream flow into the center of the channel with the installation of seven boulder vane structures. The boulder vanes would concentrate erosive energy into the maintenance of pool depth, rather than lateral gully expansion. The Proposed Action would eliminate excessive erosion of the bank, and this source of sediment into Greenhorn Creek.

In addition to the Proposed Action, the Forest Service also evaluated the effect of No Action. Based upon the effects of the alternatives, the responsible official will decide whether to implement the Proposed Action, or not take any action.





# INTRODUCTION

## Document Structure

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The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the Proposed Action and alternatives. The document is organized into five parts:

- *Introduction:* The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's Proposed Action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Environmental Consequences:* This section describes the environmental effects of implementing the Proposed Action and other alternatives. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Mt Hough Ranger District Office located at 39696 Highway 70 in Quincy, CA.

## Background

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The Feather River Coordinated Resource Management Group (FR-CRM) is a partnership of 23 agencies and other entities working together to address erosion and other natural resource issues in the upper Feather River watershed across jurisdictional boundaries. The Plumas National Forest is a signatory to the Feather River CRM Memorandum of Understanding (1985). Erosion along Greenhorn Creek was one of the early projects adopted by the FR-CRM.

The Integrated Greenhorn Creek Restoration Project Reid/PNF Treatment Unit is partially located on an isolated parcel of National Forest System lands surrounded by private lands in American Valley. Feather River Coordinated Resource Management began work on private land in Greenhorn Creek in 1991, with efforts to stabilize 2,800

feet of eroding stream banks in two treatment areas: one just above Highway 70 on the Farnworth property, and one approximately 2,600 feet below Highway 70. Techniques included re-designing channel meanders within the existing channel entrenchment, and incorporating wood and boulders into the meander bands for stability. Those efforts were marginally successful, and stabilizing vegetation continues to grow in these areas. However, soon after the projects were built, high flows transported large volumes of bedload into the project areas, and most of the constructed meanders were abandoned. Critical analysis of the performance of those projects by FR-CRM partners led to the development of alternative restoration techniques, including the boulder vane technique that is proposed in this project. Boulder vanes were installed on the Farnworth property in 2001 to address 200 feet of eroding bank. That effort was successful, resulting in the Integrated Greenhorn Creek Restoration Project proposal to expand those boulder vanes downstream on the Farnworth property approximately 200 feet. A small pond and plug project was completed on Clear Stream, a tributary to Greenhorn Creek in 2002 on the New England Ranch. Rip rap bank stabilization was also completed in the 1990's on the Bresciani Ranch near the mouth of Greenhorn Creek. Many other landowner-initiated stabilization projects have occurred over the years.

Several landowners approached the FR-CRM in 2008 to request assistance with on-going bank erosion. The FR-CRM applied for, and was awarded, a planning grant from the Plumas County Board of Supervisors, using funding from Title III of the Secure Rural Schools and Community Self-Determination Act. Surveys and analysis completed with that funding resulted in identification of the proposed six treatment units that comprise the Integrated Greenhorn Creek Restoration Project. The FR-CRM applied for, and was awarded, funding from the Plumas County Resource Advisory Committee, with Title II money of the same Secure Rural Schools Act. That funding is currently being used to fund the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) analyses, and permitting for all proposed project activities in the Integrated Greenhorn Creek Restoration Project, as well as implementation of the proposed treatment in the 1.2 acre Reid/PNF Treatment Unit.

Because of the mixed ownership of the Reid/PNF Treatment Unit, and only private ownership of all other treatment units, two separate NEPA and CEQA documents are being prepared. The NEPA document, subject to a NEPA Decision by the Mt Hough District Ranger only concerns one unit: the Reid/PNF Treatment Unit. All six units are subject to CEQA and permitting. The implementation of any one of the six Treatment Units identified in the Integrated Greenhorn Creek Restoration Project is not dependent upon the implementation in any other unit. Implementation on National Forest System lands does not affect implementation on any private land (except the private land within the Reid/PNF Treatment Unit), nor would it be affected by any other private land implementation decision. Because the Proposed Actions are not interdependent, it is appropriate to address the environmental review of the public land and private land portions of the Integrated Greenhorn Creek Restoration Project in this way.

It is not known when the Greenhorn Creek channel became entrenched, but the present day condition of the channel is likely the result of a combination of long term effects due to over 100 years of roading, railroads, intensive agriculture, logging, fires, floods, and residential land use. Over time, the function of the floodplain has diminished, and current

land use constraints require that any restoration work remains within the confines of the existing entrenchment.

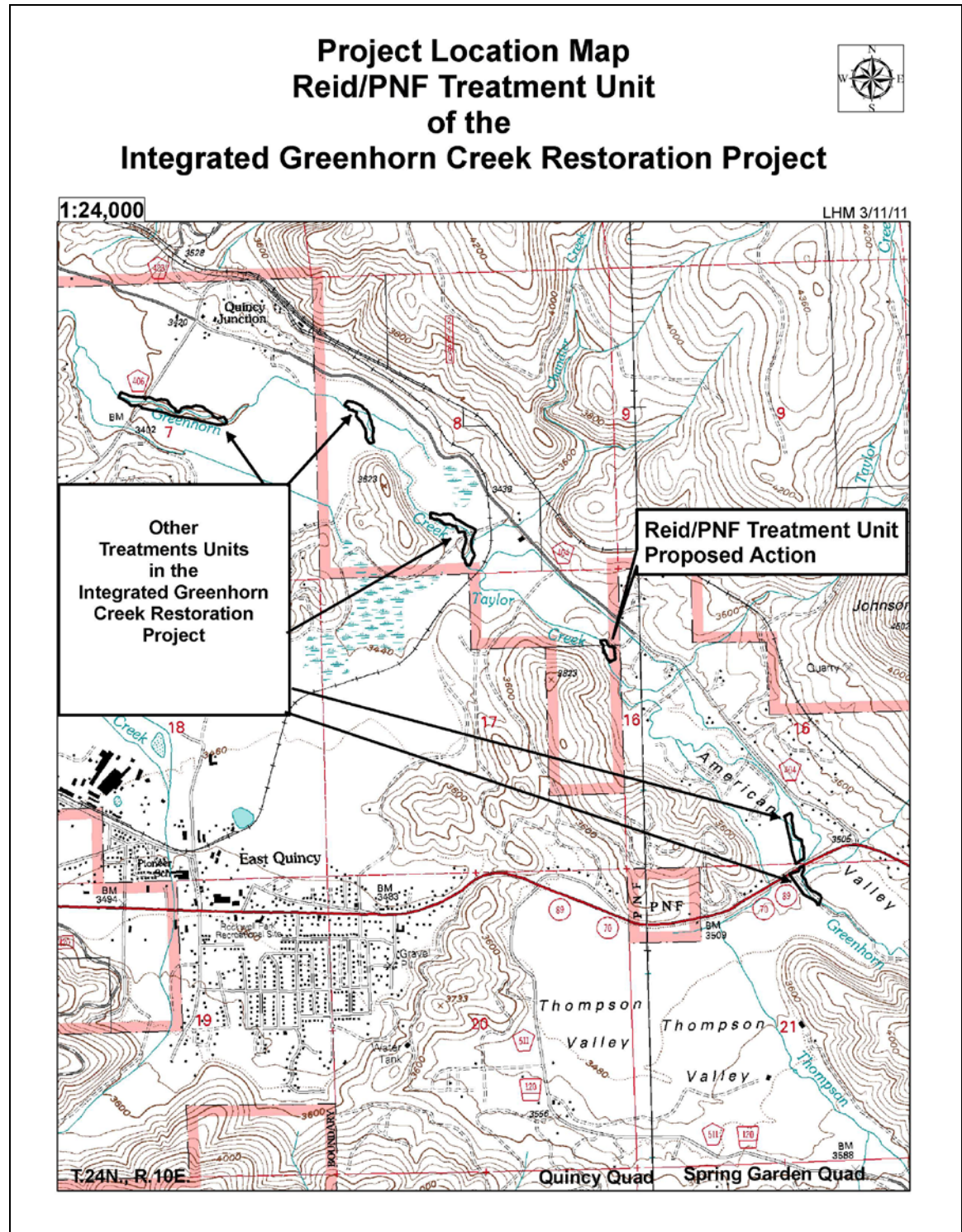


Figure 1. Project Location. The 1.2 acre Reid/PNF Treatment Unit is located in T24N R10E Section 17, approximately one air mile northeast of Quincy, CA.

## Purpose and Need for Action

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The purpose of this initiative is to reduce on-going excessive erosion along 390 feet of stream bank on Greenhorn Creek. This action is needed because the stream bank in the Reid/PNF Treatment Unit is vertical, raw, and actively eroding. The erosion contributes sediment to the channel, resulting in diminished trout habitat and water quality. Without intervention, the bank would continue to recede until an adequate floodplain width is achieved at the incised channel elevation. Implementation of the project would include laying back and vegetating the eroding bank, thus allow stabilizing vegetation to take hold and grow. The boulder vanes would concentrate erosive energy into the maintenance of pool depth, rather than lateral gully expansion.

## Measurement Indicators / Goals

- Bank Stability / Improve Stream Condition Inventory protocol (SCI) Bank Stability Rating within two years by 50%.
- % Native Vegetative Cover / Increase bank vegetation on the eroding bank from zero to 90% cover within two years.
- Pool-Riffle Ratio / Increase pool habitat within the project area from zero to 50% immediately after construction.

This action is part of a broader resource management program, under the authority of the 1988 Plumas National Forest Land and Resource Management Plan (1988 LRMP), as amended by the 1999 Herger Feinstein Quincy Library Group Forest Recovery Act (HFQLG FRA) Supplemental Final Environmental Impact Statement (SFEIS) and Record of Decision (ROD) and the 2004 Sierra Nevada Forest Plan Amendment (2004 SNFPA) SFEIS and ROD. This action is consistent with the Plumas National Forest Land and Resource Management Plan management direction for water resources in the Grizzly Ridge Management Area. General direction in this Management Area includes rehabilitating selected deteriorating watersheds to improve water quality. Standards and guidelines for water in the Grizzly Ridge Management Area include stabilizing the primary sediment sources within the Greenhorn Creek watershed in cooperation with the California Department of Fish and Game, the California Department of Transportation (CalTrans), Union Pacific, and other landowners.

This action is also consistent with the direction for riparian management described in the Herger Feinstein Quincy Library Group Forest Recovery Act (USDA Forest Service 1999), which provides “a program of riparian management, including designated riparian protection zones and riparian restoration.” In addition, it addresses the direction in the Final Environmental Impact Statement for the HFQLG FRA, that riparian areas would be managed to sustain “healthy aquatic and riparian ecosystems protected from the impacts of land use activities, but able to adjust to impacts caused by natural-occurring disturbance processes such as wildfire, flood and drought. Streams and their riparian areas would be restored to their proper functioning condition.”

## Proposed Action

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The action proposed by the Forest Service to meet the purpose and need is to stabilize the eroding bank. This action has changed slightly from the Proposed Action described in the

scoping document, which was circulated in March 2011. The following changes have been made to improve the success of the treatment: transferring gravel and transplanting plants from the gravel bar that comprises the opposite bank to the treatment bank, and a fewer number of vanes positioned at a more acute angle to the treatment bank. This was necessary because the material on the vertical bank would not be enough to build the sloped bank, and the gravel bar elevation would need to be lowered for floodplain function. The Proposed Action addressed in this analysis includes: laying back and vegetating 390 feet of eroding bank with a floodplain bench, using some of the material from the opposite gravel bar, and installing boulder vanes to concentrate erosive energy into the maintenance of pool depth, rather than lateral gully expansion. The Proposed Action, including mitigation measures, is described in more detail under “Description of the Alternatives”.

## **Decision Framework**

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The Mt Hough District Ranger is the Responsible Official for the Reid/PNF Treatment Unit, and expects to make a decision on this project as early as June or July 2011. Implementation could begin as early as late summer or early fall 2011. The Responsible Official will decide whether to implement the project as stated in the Proposed Action, or not to implement the project at this time (referred to in this analysis as the No Action Alternative, or No Action).

Activities proposed on private land associated with the Integrated Greenhorn Creek restoration Project will be analyzed under the CEQA process. Plumas County will act as the lead agency and decision-making body for those activities. The Reid/PNF Treatment Unit also encompasses private land, and will be included in the CEQA analysis. It should be noted that the Reid/PNF Treatment Unit, and all activities associated with Integrated Greenhorn Creek Restoration Project will also be subjected to the following permitting requirements:

- Army Corps of Engineers 404 Permit
- California Department of Fish & Game Streambed Alteration Agreement
- Regional Water Quality Control Board 401 Water Quality Certification (including a stormwater pollution prevention plan permit)

The CEQA process and scoping is expected to roughly follow the same timeline as the NEPA process.

## **Public Involvement**

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The proposal was listed in the Schedule of Proposed Actions on September 15, 2010. The proposal was provided to the public and other agencies for comment during scoping from March 2 to April 4, 2011. A scoping ad was placed in the Feather River Bulletin on March 2, 2011, and 32 Proposed Action scoping packets were mailed out from the District office on February 24, 2011. As additional interested parties identified themselves, 14 additional scoping packages were emailed during the scoping period, on March 11, 2011. Four comments were received: one letter to the district, two emails and a phone call to Leslie Mink at Plumas Corporation.

None of the comments required the development of another alternative for the Reid/PNF Treatment Unit, because they could be addressed in this Environmental Analysis document, or through mitigation. One of the comment letters pertained to treatment of cultural resources, which is already decided by law. Another concerned water rights and causes of the existing condition, both of which are addressed in the Hydrology section of this document. One of the comments pertained to one of the treatment units on private land, and thus, is out of the scope of this analysis. The other comment email contained 26 comments, that were sent in response to the scoping package sent out through the CEQA process. Most of the comments pertained to the CEQA process, and thus are outside of the scope of this analysis for the Reid/PNF Treatment Unit. The actual comments and a summary of the comments are available in the project record at the Mt Hough Ranger District and at Plumas Corporation.

## **DESCRIPTION OF THE ALTERNATIVES**

### **No Action**

Under the No Action alternative, no activities would occur or be implemented. Conditions and trends within the project area would remain the same as currently exists.

### **The Proposed Action**

The Proposed Action addressed in this analysis includes:

- laying back and vegetating 390 feet of eroding stream bank to a 1.5:1 slope,
- constructing a floodplain bench at the base of the laid back bank,
- reducing the elevation of the gravel bar on the opposite side of the channel to floodplain elevation,
- removing gravel and vegetation from the opposite bank to place on the constructed floodplain bench,
- installing boulder vanes to concentrate erosive energy into the maintenance of pool depth, rather than lateral gully expansion.

To minimize negative effects to resources, the following mitigation measures would be employed as part of the Proposed Action:

- De-watering the work area by constructing a temporary bypass channel on the gravel bar, placing straw and plastic dams above and below the work area, and pumping additional groundwater seepage water out of the work area onto nearby vegetation, so that it filters out fine sediment before re-entering the channel. Sedimats® would be employed on the channel bottom below the project work area to trap sediment that escapes the work area.
- Surveying the project area and nearby habitats for sandhill cranes (1/2 mile radius), willow flycatcher (1/4 mile radius), and pond turtles (areas to be disturbed) prior to construction, and delaying construction until the end of the Limited Operating Period, or creating a buffer zone of non-activity to eliminate direct impacts if any of the target species are found.

- Flagging and avoiding any sensitive plants that are found during construction. (None were identified during resource surveys in 2010).
- Treating noxious weeds (Canada thistle, star thistle, and medusahead) by hand-pulling or hand-digging. Weeds would be monitored and treated for three years following construction.
- Seeding and mulching all disturbed areas with native seed and weed-free mulch.
- Heavy equipment travel on the terraced floodplain would be minimized in order to minimize compaction.
- Topsoil on the top of the bank to be sloped would be removed, stock-piled, and spread on the sloped bank in order to retain organic matter and nutrients.



**Proposed Action - Plan View  
Reid/PNF Treatment Unit  
Integrated Greenhorn Creek Restoration Project**

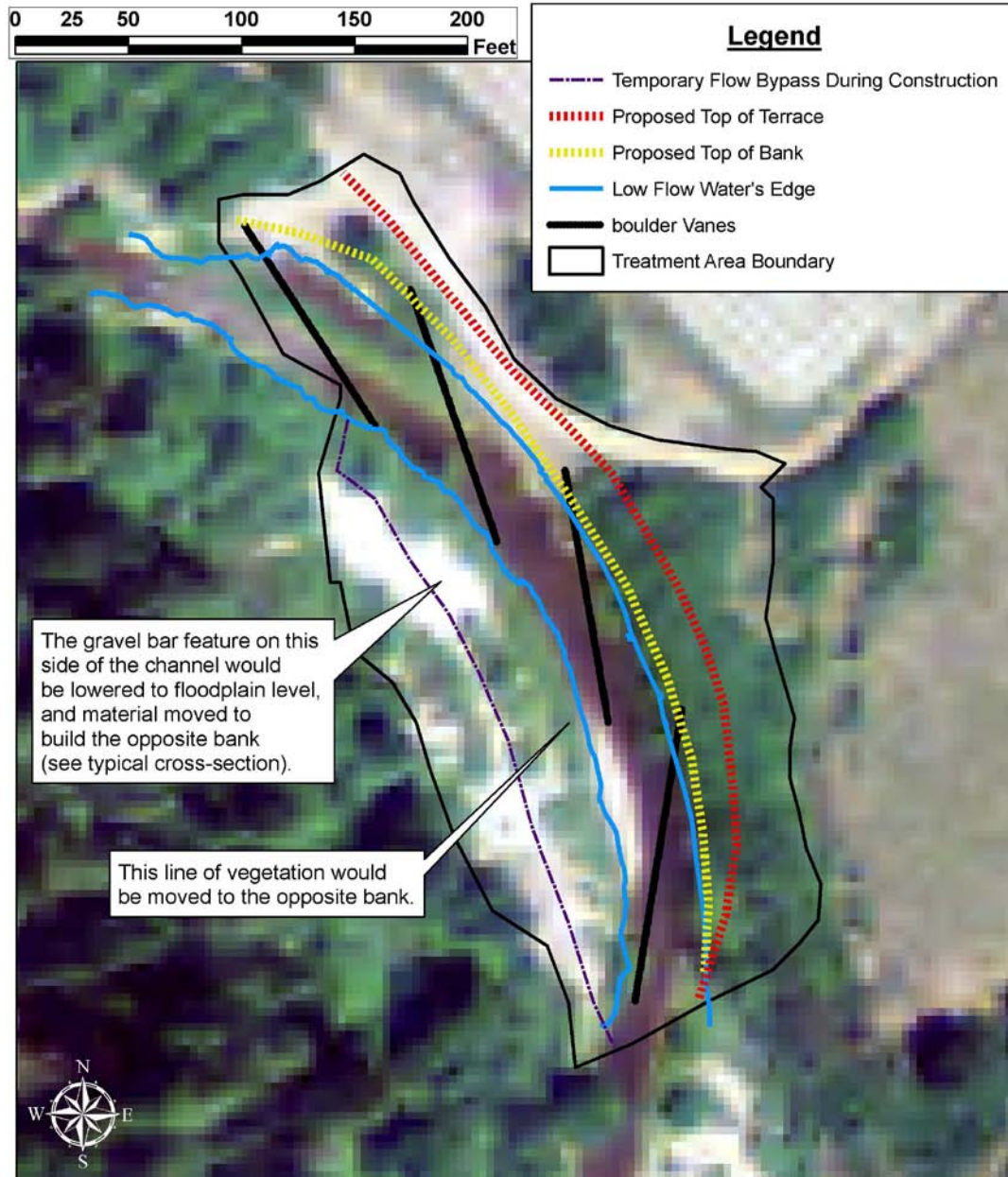
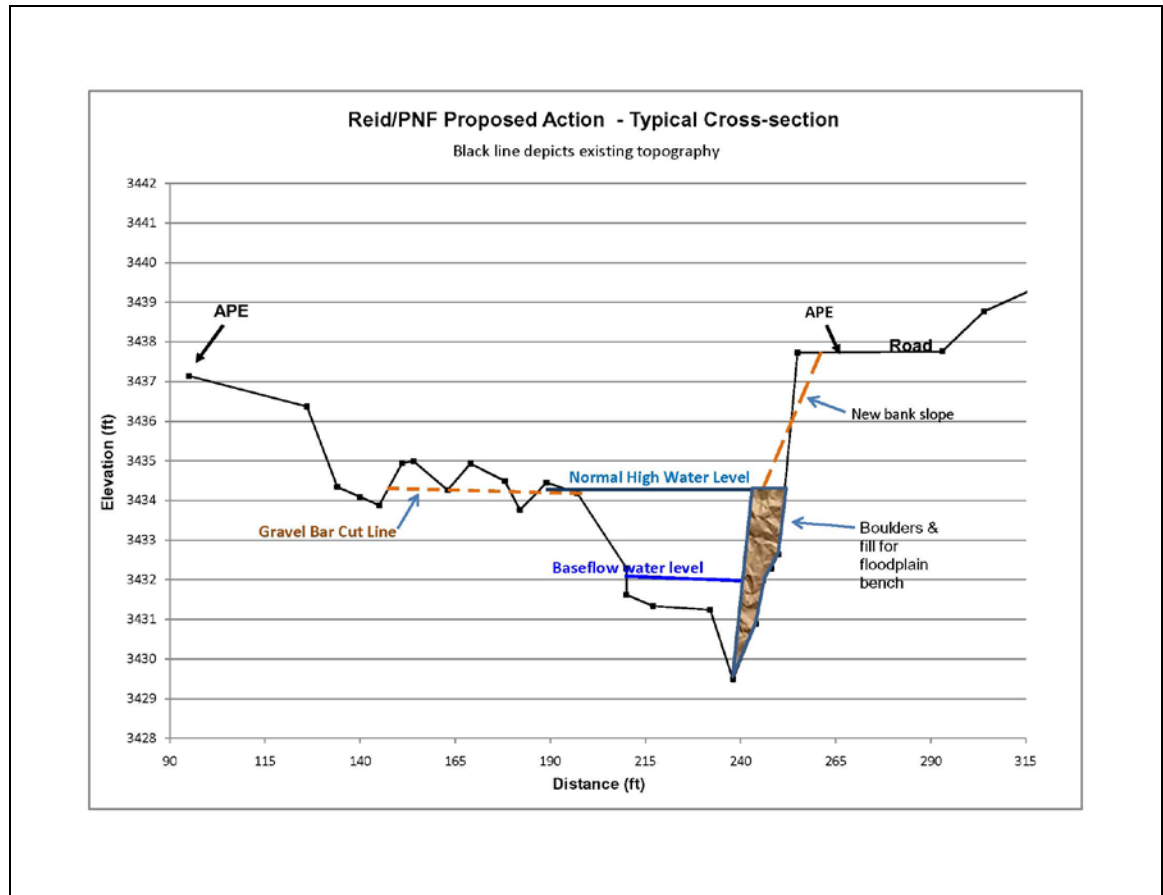


Figure 2. Plan Area View of the Proposed Action.





**Figure 3. Reid/PNF Bank Proposed Action Typical Cross-section.**

## Other Alternatives Considered, but Not Analyzed

More treatments were considered on private land, however, only the treatment polygons shown in Figure 1 are being considered for implementation. The other treatments were dropped from further consideration due to difficulty of access or potential for failure.

## Comparison of Alternatives

This section provides a summary of the effects of implementing either alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively between the alternatives.

Table 1. Summary of Effects of the Proposed Action and No Action.

	No Action	Proposed Action
Botany	No effect to sensitive plants. Continued habitat degradation from eroding banks and downcutting channel, and potential for noxious weed infestation on newly exposed eroding soil	No effect to sensitive plants. Short term potential for weed proliferation (see mitigation); long term improvement in habitat stability and native vegetation establishment
Wildlife	No change in existing trend of habitat components	Short term disturbance due to construction; long term habitat improvements due to increased vegetation and decreased erosion/sedimentation
Water	No change in current trends, i.e. continued long term sedimentation from eroding bank	Short term sedimentation increase due to construction; minimized with mitigations & BMPs to reduce long term sedimentation.
Soils	No change in current trends	Short term potential for compaction & decrease in organic matter; minimized with mitigations & BMPs
Cultural Resources	No Effect – No resources in the project area	Same as No Action Alternative
Range	No effect to range resources	No effect to range resources

## AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

### Introduction

This chapter summarizes the physical and biological environments of the Reid/PNF Treatment Unit and the effects of each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives discussed above. Affected environments have been divided by resource areas, whereas environmental consequences have been divided by resource areas and then by alternative, where each alternative is discussed separately. Further effects analyses that are required by law are discussed per alternative.

When applicable, resource sections in this chapter are a summary of project-specific reports prepared by Forest Service specialists, Plumas Corporation staff, and/or contractors, and are incorporated by reference into this Environmental Assessment. The following reports and memoranda are incorporated by reference: Botanical Biological Evaluation and Biological Assessment; Noxious Weed Risk Assessment; Wildlife Biological Assessment/Biological Evaluation; Management Indicator Species Report; Migratory Bird Report; and Cultural Resources Report. These reports (except the administratively confidential cultural resource report) are part of the project record on file at the Mt. Hough Ranger District office, and at the Plumas Corporation office, both located in Quincy, CA.

## Past, Present and Reasonably Foreseeable Actions

According to the Council on Environmental Quality NEPA regulations, “cumulative impact” is the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7). In determining cumulative effects, the past, present and future actions displayed in the following table are added to the direct and indirect effects of the Proposed Action and No Action Alternative.

Table 2. Past, present and reasonably foreseeable future actions considered in the analysis of the Reid/PNF Treatment Unit.

Project	Date	Acreage	Comments
<b>Past Activities</b>			
Bank Stabilization*	1991-2001	0.75 acres	Completed in 1991; maintenance in 2001 on 0.04 acres
<b>Present &amp; On-going Activities</b>			
Empire Sale**	2010-2012	1,031 acres group selection; 4,168 acres of mechanical thin; 380 acres of hand thin/pile /burn; and 2.75 miles of road decommissioning	
Agricultural & Residential Housing* land use around Greenhorn Creek	On-going	448 acres	
<b>Reasonably Foreseeable Future Activities</b>			
American Valley Fuels Reduction Project**	2011-2012	166 acres	
Bank stabilization & fish passage	2012	19 acres	Activities on the other 5 polygons in the Integrated Greenhorn Creek Restoration Project

\*Past bank stabilization projects and land use contribute to the existing condition in and surrounding the project area. Only agricultural use is discussed further as an on-going use, as it is the use most closely associated with the project area and project activities.

\*\* Both of these projects are located at least partially in the Greenhorn Creek watershed, however, the implementation of Best Management Practices renders these timber management projects much less likely to measurably or cumulatively impact the Integrated Greenhorn Creek Restoration project area than the other activities listed above. These two timber management activities will not be discussed further in this document.

In order to understand the contribution of past actions to the cumulative effects of the Proposed Action and No Action Alternative, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

## BOTANY

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### AFFECTED ENVIRONMENT

The 1.2 acre Reid/PNF Treatment Unit is comprised of pasture/riparian habitat on the surface of the meadow, and riverine habitat within an eight-foot deep entrenchment. An unimproved agricultural two track road is currently used to access the area, and would be used for access during construction. The following two sensitive plant species may have potential habitat in the area: *Lupinus dalesae* and *Cypripedium montanum*. The following two special interest plants may also have potential habitat in the area: *Pseudostellaria sierrae* and *Carex sheldonii*. The two special interest plants are not protected by law, nor regulation. Protection is recommended when feasible, but is not required.

There are small occurrences of Canada thistle (*Cirsium arvense*), and medusahead (*Taeniatherum caput-medusae*) in the Reid/PNF Treatment Unit. These weeds, and yellow star thistle (*Centaurea solstitialis*) as well, are common in the surrounding area.

### ENVIRONMENTAL EFFECTS - BOTANY

#### **No Action Alternative**

There are expected to be no direct effects from the No Action alternative, because there would be no project activities.

Indirect effects from No Action are those associated with continued habitat degradation through widening and down-cutting of the gullied stream banks, and the indirect effects of potential noxious weed proliferation, as bare soil continues to be exposed from erosion, and thus, subject to infestation.

The project area is excluded from grazing, so there would be no cumulative effects under this alternative from agriculture. Cumulative effects from other bank stabilization and fish passage activities associated with the Integrated Greenhorn Creek Restoration Project would likely still occur. Cumulative effects to plants under this alternative from other activities could include increased short term potential noxious weed seed sources. However, this effect is unlikely because noxious weeds would be treated in the other polygons (i.e. removed for three years) as they would in this Treatment Unit.

#### **Proposed Action Alternative**

No sensitive plants were detected during project-level field surveys. However, if undetected plants occur in the area, direct effects could occur to sensitive plants during stream channel rehabilitation and bank stabilization construction work. Using heavy machinery to perform restoration activities has the potential to directly impact sensitive plants by crushing plants, displacing soil and plants, or smothering plants with soil. Direct effects are unlikely since no sensitive plants were found. However, any undetected sensitive plants could be affected. Mitigation includes flagging and avoiding any sensitive plants that may be found during construction.

Indirect effects to sensitive plants would be most likely via the potential for noxious weeds. Noxious weeds can be brought into the project area in road materials and mulch, and spread from existing occurrences within the project area. Once established, noxious

weeds can be difficult to control and eliminate from an area. Noxious weeds displace native plant habitat and degrade watershed functions. If the standard management requirements such as inventory, flagging and avoiding noxious weed areas, cleaning equipment, using weed free material and mulch, removing plants and/or seed heads prior to construction, and removing noxious weed plants for three years after construction are utilized, the spread of noxious weeds can be greatly reduced.

The extent of cumulative effects depends on the management of potential direct and indirect effects, as well as the attributes of the sensitive plant species located within the analysis area, their distribution within the analysis area, and designing projects with sensitive plant attributes in mind. Overall, management of the direct and indirect effects through project design and mitigation measures is the most effective way to minimize the potential for cumulative effects.

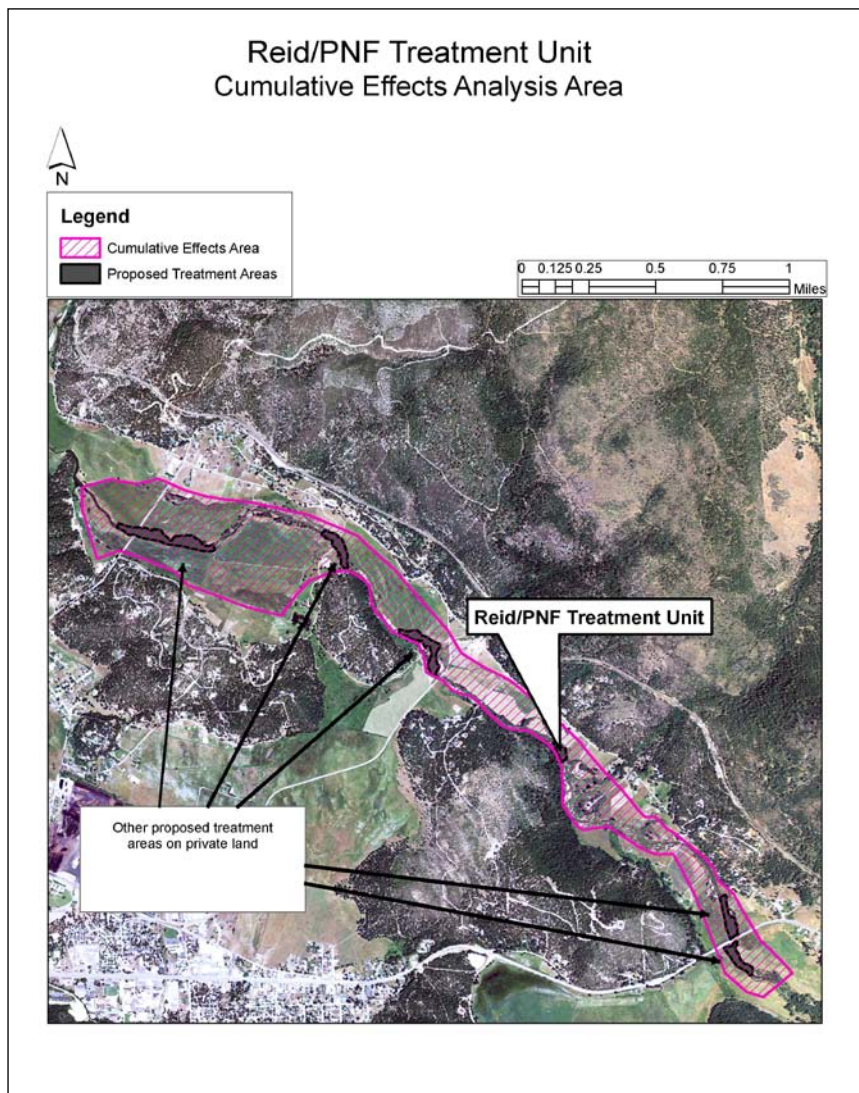
Noxious weeds will continue to pose a threat to native plant habitat and sensitive plant species under either alternative. However, with the proposed treatments in five other polygons on private lands, noxious weeds can more easily invade the area. Cumulatively, if this disturbance is applied without standard management requirements, noxious weeds could easily proliferate. Grazing does not occur in the project area, but does occur around the project area. Grazing can result in the degradation of sensitive species populations through trampling, loss of proper hydrologic function by streamside trampling, and the loss of reproduction for the season by browsing buds and flowers before they go to seed. However, since no sensitive species were found during field surveys, this cumulative effect is unlikely. Standards and guidelines applied to all foreseeable future actions associated with the Integrated Greenhorn Creek Restoration Project would reduce cumulative effects on sensitive plant species.

Adverse effects to botanical resources are not expected as a result of implementation of the Reid/PNF treatment Unit Proposed Action for the following reasons: the project area has been adequately surveyed for plant species of concern, and none were found; any species of concern that are discovered during project activities will be flagged and avoided, if possible, while still carrying out the intent of the project; management practices to control noxious weeds would be implemented within the project area, as well as the other treatment polygons on private land.

## WILDLIFE

Effects to wildlife are analyzed in three separate documents, which are incorporated into this analysis by reference, and can be found in their entirety in the Project File at the Mt Hough District office and at the Plumas Corporation office. The wildlife documents are: Wildlife Biological Assessment and Biological Evaluation for Integrated Greenhorn Creek Restoration Project, Management Indicator Species Report for the Reid/PNF Treatment Unit, and the Migratory Bird Report for the Integrated Greenhorn Creek Restoration Project.

For ease of using the same analysis reports for CEQA analysis and NEPA analysis, the wildlife analysis area encompasses most of American Valley surrounding Greenhorn Creek. The following figure displays the Reid/PNF Treatment Unit within the context of the analysis area, and in relation to the other five treatment polygons on private land.



**Figure 4. Reid/PNF Treatment Unit within the analysis area, and in relation to other treatment units.**

## Affected Environment

The following table displays existing habitat types in the Reid/PNF Treatment Unit, the other proposed treatment units on private land, and total wildlife cumulative effects analysis area.

Table 3. Existing California Wildlife Habitat Relationships habitat type acreages in the project area and wildlife analysis area.

CWHR Habitat type	Reid/PNF Treatment Unit Acres	All Treatment Units - Acreage	Total Wildlife Analysis Area <sup>4</sup> Acres
Riverine <sup>1</sup>	0.7	8.8	29.8
Montane Riparian <sup>2</sup>	(0.5) <sup>6</sup>	1.5	17.6
Pasture <sup>3</sup>	(0.5) <sup>6</sup>	11	316
Wet Meadow	0	0	32.8
Lacustrine	0	0	1.2
Non-wildlife habitat <sup>5</sup>	0	0	6.6
<b>TOTAL</b>	<b>1.2</b>	<b>21.3</b>	<b>404</b>

<sup>1</sup> Acreage based ordinary high water mark

<sup>2</sup> Acreage estimate based on established vegetation within the gully bottom

<sup>3</sup> Terrace above the gully bottom (abandoned floodplain)

<sup>4</sup> Total includes project areas

<sup>5</sup> Roads and buildings

<sup>6</sup> Pasture habitat in the Reid/PNF unit will be analyzed as montane riparian for MIS analysis, as it is adjacent to the stream channel

Riverine habitat was identified as areas within the bottom of the gully within the ordinary high water mark. Backwater areas formed by irrigation dams on Greenhorn Creek were included in riverine habitat. Riverine channels within the analysis area have degraded to an average of seven feet below the elevation of the meadow. The entrenchment of the channel has resulted in diminished riverine habitat acres that are confined to the bottom of the gully. The current condition of excessive channel erosion from entrenchment widening and deepening, results in riverine habitat with excessive sedimentation and decreased bank vegetation. These characteristics translate to diminished quality of habitat for aquatic life, including macroinvertebrates that are an important food source for many species discussed below.

There is no lacustrine habitat within any treatment unit. There is one 1.2 acre farm pond within the wildlife cumulative effects analysis area that is located on private land. This habitat would not be affected by any treatment and will not be discussed further.

In the existing degraded condition, montane riparian habitat is confined to the gully. CWHR montane riparian habitat has also been further restricted, due to the poor condition and early seral stage of riparian vegetation within the gully, resulting in no montane riparian habitat in the Reid/PNF Treatment Unit; only 1.5 acres in the other treatment polygons on private land; and 17.6 acres in the rest of the wildlife cumulative effects analysis area. However, to enable analysis of habitat acreage changes, the 0.5 acres of pasture in the Reid/PNF Unit will be analyzed as montane riparian, because it is adjacent to the channel (albeit 8 feet above the channel), and 0.1 acres of it would be converted to montane riparian.



Wet meadows are a function of channel/floodplain hydrology and soil types. Before the advent of roads, intensive agricultural and residential use along Greenhorn Creek, wet meadow was likely the predominant habitat type. Meadows within the analysis area were wetter before channel degradation. The entrenched channel throughout the length of the floodplain meadow of the analysis area has greatly altered the channel/floodplain hydrology, resulting in drier meadow conditions. In the existing condition, there are 32.8 acres of wet meadow habitat in the analysis area. There is no wet meadow habitat within the project area. The entrenched channel in the analysis area dries out the meadow by increasing drainage pressure at a lower elevation.

Channel degradation in the analysis area has contributed to some conversion of pre-degradational wet meadow or montane riparian habitat into drier habitats, such as pasture habitat. The predominant land use in the wildlife analysis area is agriculture. All of the wildlife analysis area outside of the entrenchment is in this category (except areas of wet meadow, pond or non-habitat areas). In the existing condition, there are 316 acres of pasture habitat. As mentioned above, for the analysis of habitat acreage changes, the 0.5 acres of pasture in the Reid/PNF Unit will be analyzed as montane riparian.

**TABLE 4: Threatened, Endangered, Proposed and Sensitive (TES) Animal Species that Potentially Occur on the Plumas National Forest, as of April 29, 2010.**

<i>Species</i>	<b>Category</b>
<b>INVERTEBRATES</b>	
Valley elderberry longhorn beetle ( <i>Desmocerus californicus dimorphus</i> )	Threatened
<b>FISH</b>	
Hardhead minnow ( <i>Mylopharodon conocephalus</i> )	Sensitive
<b>AMPHIBIANS</b>	
California red-legged frog ( <i>Rana aurora draytonii</i> )	Threatened
Foothill yellow-legged frog ( <i>Rana boylei</i> )	Sensitive
Mountain yellow-legged frog ( <i>Rana muscosa</i> )*	Candidate/Sensitive
Northern leopard frog ( <i>Rana pipiens</i> )	Sensitive
<b>REPTILES</b>	
Pacific pond turtle ( <i>Actinemys marmorata marmorata</i> )	Sensitive
<b>BIRDS</b>	
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Sensitive
Northern Goshawk ( <i>Accipiter gentiles</i> )	Sensitive
California spotted owl ( <i>Strix occidentalis occidentalis</i> )	Sensitive
Great gray owl ( <i>Strix nebulosa</i> )	Sensitive
Willow flycatcher ( <i>Empidonax trailii brewsteri</i> )	Sensitive
Greater sandhill crane ( <i>Grus canadensis tabida</i> )	Sensitive
Swainson's hawk ( <i>Buteo swainsoni</i> )	Sensitive

MAMMALS	
Sierra Nevada red fox ( <i>Vulpes vulpes necator</i> )	Sensitive
American marten ( <i>Martes americana</i> )	Sensitive
Pacific fisher ( <i>Martes pennant pacifica</i> )	Candidate
California wolverine ( <i>Gulo gulo luteus</i> )**	Sensitive/ Candidate
Pallid bat ( <i>Antrozous pallidus</i> )	Sensitive
Western red bat ( <i>Lasiurus blossevillii</i> )	Sensitive
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	Sensitive

\* discussed in this report as Sierra Nevada yellow-legged frog

\*\*As of December 24, 2010, California wolverine is a candidate species.

Several T&E species identified by the US Fish and Wildlife Service in the “Federal Endangered and Threatened Species that may be affected by Projects in the Plumas National Forest” list, updated April 29, 2010, have been eliminated from further analysis, based on past analysis and concurrence from the USFWS (HFQLG BA/BE Rotta 1999, USFWS letter 1-1-99-I-1804 dated August 17, 1999) or due to lack of species distribution and/or lack of designated critical habitat. These species are listed below:

- Winter Run Chinook Salmon (*Oncorhynchus tshawaytsha*)
- Conservancy Fairy Shrimp (*Branchinecta conservatio*)
- Central Valley steelhead (*Oncorhynchus mykiss*)
- Delta Smelt (*Hypomesus transpacificus*)
- Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)
- Central Valley spring-run Chinook salmon (*Oncorhynchus tshawaytsha*)
- Carson wandering skipper (*Pseudocopa eodes eunus obscurus*)
- Critical Habitat for vernal pool invertebrates (Butte County)
- Critical habitat for California red-legged frog

In addition, there is no known habitat, have been no observations, and the analysis area is above the elevational range for the valley elderberry longhorn beetle, a threatened species. Therefore, this species will not be discussed further. There is also no suitable habitat and have been no observations of the following sensitive species in, or near, the analysis area: hardhead minnow, northern leopard frog, Swainson's hawk, and all sensitive forest carnivores (Sierra Nevada red fox, American marten, Pacific fisher, California wolverine). Therefore, these seven species will not be discussed further in this document. Sensitive carnivores also are not likely to occupy habitat with as much residential and agricultural activity as occurs in, and around, the analysis area.

The closest known population of California red-legged frogs to the project area is over 30 air miles southwest of the project area, in a drainage that is directly tributary to the pool of Lake Oroville. It would be nearly impossible for this closest known population to colonize the project area, with numerous reservoirs, and over 80 stream miles between this population and the project area. The nearest critical habitat is located at approximately 2,200 foot elevation, also over 30 air miles from the project area. Abundant surveys have been conducted throughout the Plumas National Forest over the past 15 years, with no new populations found, nor is any critical habitat located within Plumas County. No CaRLF individuals were found during project-specific surveys for

the Integrated Greenhorn Creek Restoration Project (including the potential private land treatment areas). Therefore this species would not be affected by the Proposed Action, and will not be discussed further. Other species listed in the above table are discussed further below. The US Fish and Wildlife Service has not been consulted specifically regarding the Reid/PNF treatment Unit Proposed Action, or the rest of the Integrated Greenhorn Creek Restoration Project, because there would be no affect to any federally listed species.

**Table 5. Selection of Management Indicator Species for Project-Level Habitat Analysis for the Reid/PNF Treatment Unit.**

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component <sup>1</sup>	Sierra Nevada Forests Management Indicator Species <i>Scientific Name</i>	Category for Project Analysis <sup>2</sup>
Riverine & Lacustrine	lacustrine (LAC) and riverine (RIV)	aquatic macroinvertebrates	3
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH), chamise-redshank chaparral (CRC)	fox sparrow <i>Passerella iliaca</i>	1
Oak-associated Hardwood & Hardwood/conifer	montane hardwood (MHW), montane hardwood-conifer (MHC)	mule deer <i>Odocoileus hemionus</i>	1
Riparian	montane riparian (MRI), valley foothill riparian (VRI)	yellow warbler <i>Dendroica petechia</i>	3
Early Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	Mountain quail <i>Oreortyx pictus</i>	2
Mid Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 4, all canopy closures	Mountain quail <i>Oreortyx pictus</i>	1
Late Seral Open Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 5, canopy closures S and P	Sooty (blue) grouse <i>Dendragapus obscurus</i>	1
Late Seral Closed Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6.	California spotted owl <i>Strix occidentalis occidentalis</i>	1
		northern flying squirrel <i>Glaucomys sabrinus</i>	
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker <i>Picoides villosus</i>	2
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker <i>Picoides arcticus</i>	1
Wet Meadow	Wet meadow (WTM), freshwater emergent wetland (FEW)	Pacific treefrog <i>Pseudacris regilla</i>	2

<sup>1</sup> All CWHR size classes and canopy closures are included unless otherwise specified; **dbh** = diameter at breast height; **Canopy Closure classifications:** S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); **Tree size classes:** 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(≥24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

<sup>2</sup> **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.

**Category 2:** MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.

**Category 3:** MIS whose habitat would be either directly or indirectly affected by the project.

Fox sparrow, mule deer, mountain quail (representing mid-seral coniferous forest), sooty blue grouse, California spotted owl, northern flying squirrel, and black-backed

woodpecker, identified as Category 1 above, will not be further discussed because the habitat factors for these species are not in or adjacent to the Wildlife Analysis area; therefore, the project will not directly or indirectly affect the habitat for these species, and will, therefore, have no impact on forest-level habitat or population trends.

Mountain quail (representing early seral coniferous forest), hairy woodpecker, and Pacific treefrog, identified as Category 2 above, have habitat in or adjacent to the Wildlife Analysis area but will not be discussed further because the habitat factors for these species would not be either directly or indirectly affected by the project; therefore, the project will not affect habitat for these species and will therefore have no impact on forest-level habitat or population trends.

The Management Indicator Species (MIS) whose habitat would be either directly or indirectly affected by the project, identified as Category 3 in Table 5, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the Proposed Action and alternatives on the habitat of these MIS. The MIS selected for project-level MIS analysis for the Reid/PNF Treatment Unit are: aquatic macroinvertebrates, yellow warbler.

**Table 6.** Analysis of Migratory Birds for the Reid/PNF Treatment Unit.

Birds of Conservation Concern (Sierra Nevada - BCR 15)	Surrogate Forest Service Sensitive Species (S) or Management Indicator Species (MIS) addressed for this project	Location of Project Level Analysis	Critical Habitat component or threat
Bald Eagle	Bald Eagle (S)	BA/BE	Designated as a non-land bird by DeSante
Peregrine Falcon		See below	Dependent on adequate nesting ledges
Flammulated Owl	Mule Deer (MIS) Hairy Woodpecker (MIS)	MIS	Moderately open coniferous forests with snags
California Spotted Owl	California Spotted Owl (S)	BA/BE	Depends critically on old growth
Calliope Hummingbird	Sooty (Blue) Grouse (MIS) Yellow Warbler (MIS) Willow Flycatcher (S)	MIS MIS BA/BE	Open Forested habitats, and moist habitats on the East Slope
Lewis' Woodpecker	Hairy Woodpecker	MIS	Loss of Snags
Williamson's Sapsucker	Hairy Woodpecker	MIS	Loss of Snags
Olive-sided Flycatcher	California Spotted Owl (S) Hairy Woodpecker	BA/BE MIS	Utilize late successional/old growth forest, but does not depend on it critically; Loss of Snags
Willow Flycatcher	Willow Flycatcher (S)	BA/BE	Depends critically on Montane Meadow habitat
Cassin's Finch	California Spotted Owl (S)	BA/BE	Depends critically on old growth, preferring open red fir or lodgepole forests
Black Swift		See below	Requires sheer, well-shaded cliffs, often near waterfalls for nesting.

**Peregrine Falcon:** PNF biologists have reviewed habitat for the Peregrine Falcon on the Plumas NF extensively since the early 1980's. Habitat for the Peregrine consists of five

rock cliff sites on and adjacent to the Forest, located at Bald Rock, Canyon Dam, Pulga, Bonta Ridge, and Beckwourth Butte. Disturbance to these habitats is limited, as most activities do not impact these rock cliff sites. Peregrine chicks were cross-fostered into a prairie falcon eyrie near Dixie Mountain (approximately 32 miles east of the project site), from 1985-1992 but there has not been any subsequent nesting in the area. Projects with an analysis area that falls within a ½ mile vicinity of these five would analyze impacts to Peregrine Falcon, whereas projects with an analysis area outside of a ½ mile vicinity of these sites would not require further analysis. No known sites occur in, or are within, ½ mile of the Integrated Greenhorn Creek Restoration Project Wildlife Analysis area, thus, this species will not be discussed further.

**Black Swift:** Based on surveys and work by the Plumas County Audubon Society (C. Dillingham, pers comm.) the black swift is a rare spring and fall migrant across the PNF and has not been confirmed as a resident on the PNF. However suitable wet cliff/waterfall habitat does occur at selected sites on the Forest. Two sites appear to be suitable for black swifts; Feather Falls on the Feather River District, and Frazier Falls on the Beckwourth District. Both sites fall within recreation areas or recreation sites, and do not receive ground disturbing activities that would modify or alter habitat values for the black swift. Projects with an analysis area that falls within a ½ mile vicinity of these two sites would analyze impacts to black swift habitat, whereas projects with an analysis area outside of a ½ mile vicinity of these sites would not require further analysis. No known sites occur in or near the Integrated Greenhorn Creek Restoration Project Analysis area, thus, this species will not be discussed further.

### ***Environmental Effects – Effects on Habitat***

Table 7.\* California Wildlife Habitat Relationships habitat type acreages in the existing condition (No Action) compared to expected acreages under the Proposed Action.

<b>CWHR Habitat type</b>	<b>Reid/PNF Treatment Unit</b>		<b>All Treatment Units</b>		<b>Total Wildlife Analysis Area<sup>4</sup></b>	
	<b>No Action</b>	<b>Proposed Action</b>	<b>No Action</b>	<b>Proposed Action</b>	<b>No Action</b>	<b>Proposed Action</b>
<b>Riverine</b>	0.7	0.7	8.8	8.8	29.8	29.8
<b>Montane Riparian</b>	(0.5)	0.1	1.5	1.8	17.6	17.9
<b>Pasture</b>	(0.5)	0.4	11	10.7	316	315.7
<b>Wet Meadow</b>	0	0	0	0	32.8	32.8
<b>Lacustrine</b>	0	0	0	0	1.2	1.2
<b>Non-wildlife habitat</b>	0	0	0	0	6.6	6.6
<b>TOTAL</b>	<b>1.2</b>	<b>1.2</b>	<b>21.3</b>	<b>21.3</b>	<b>404</b>	<b>404</b>

\* See footnotes under Table 3.

As can be seen in the above table, there would be no change to habitat under the No Action Alternative. Implementation of the Proposed Action in the Reid/PNF Treatment Unit is expected to alter existing riverine and pasture habitat, and create montane riparian habitat. In considering cumulative effects, within the five other treatment polygons on private land, treatments would affect riverine, montane riparian, and pasture habitat.

Direct effects to habitat include: (1) temporarily routing channel flows from the existing channel into a bypass channel during construction; (2) increasing the percentage of pool

(versus riffle) habitat; (3) increasing bank angle (from vertical to a 1:1 slope) so that vegetation can become established; (4) removing riparian vegetation from the gravel bar, and planting it on the banks; (5) increasing riparian vegetation (sedges, willows, and alders where available) on the newly sloped bank; (6) slightly decreasing pasture habitat to improve the bank angle on vertical banks; (7) increasing montane riparian habitat by planting a bank that currently does not support vegetation; (8) temporarily increasing sedimentation during construction, that would be minimized by mitigation measures and adherence to Best Management Practices (BMPs); and (9) improving water quality of riverine habitat in the long term by decreasing sedimentation from eroding banks.

Indirect effects to habitat would be due to disruption of the channel during construction, which would cause a temporary reduction (less than six months) in aquatic macro-invertebrates that are prey for Pacific pond turtles, greater sandhill crane, willow flycatcher, pallid bat, Townsend's big-eared bat, western red bat, and yellow warbler. The reduction in sediment, however, is expected to improve habitat for macroinvertebrates, and thus indirectly improve habitat for those species by increasing their prey base.

In order to understand the contribution of past actions to the cumulative effects to habitat of the Proposed Action and No Action alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. Cumulative effects considered in this analysis are listed in Table 2. While agriculture (grazing and haying) is a primary land use in the valley analysis area, these activities do not occur within the Reid/PNF Treatment Unit project area; nor is there any residential housing in the Reid/PNF Treatment Unit. The primary action contributing to cumulative effects to wildlife is the reasonably foreseeable bank stabilization and fish passage treatments in the five polygons on private land that are associated with the Integrated Greenhorn Creek Restoration Project. Cumulative effects from these treatments would involve sedimentation and disturbance to montane riparian habitat. Effects on sedimentation include a short term potential increase in sedimentation during construction that would be minimized with water quality protection and erosion control practices; and a long term reduction in sedimentation, due to the treatment of eroding banks. Similarly, these activities would create a short term disturbance to montane riparian habitat, and a long term enhancement to montane riparian habitat.

### **Environmental Effects – Effects on TES Species**

Table 8. Summary of determinations on Threatened, Endangered, Candidate, and Sensitive animal species that potentially occur on the PNF. WNA = Will Not Affect; MAI = May Affect Individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Species	Proposed Action	No Action
<b>AMPHIBIANS</b>		
California red-legged frog ( <i>Rana draytonii</i> )	WNA	WNA
Foothill yellow-legged frog ( <i>Rana boylei</i> )	WNA	WNA
Sierra Nevada yellow-legged frog ( <i>Rana sierrae</i> )	WNA	WNA
<b>REPTILES</b>		
Pacific pond turtle ( <i>Actinemys marmorata marmorata</i> )	MAI	WNA
<b>BIRDS</b>		
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	MAI	WNA

Greater sandhill crane ( <i>Grus canadensis tabida</i> )	MAI	WNA
Great Gray Owl ( <i>Strix nebulosa</i> )	WNA	WNA
Spotted Owl ( <i>Strix occidentalis</i> )	WNA	WNA
Goshawk ( <i>Accipiter gentilis</i> )	WNA	WNA
Willow flycatcher ( <i>Empidonax trailii brewsteri</i> )	MAI	WNA
<b>MAMMALS</b>		
Pallid bat ( <i>Antrozous pallidus</i> )	MAI	WNA
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	MAI	WNA
Western red bat ( <i>Lasiurus blossevillei</i> )	MAI	WNA

## **No Action Alternative**

### **Direct, Indirect, and Cumulative Effects to TES Species**

The No Action Alternative would result in no direct change in current conditions and trends within the analysis area. The opportunity to improve riparian and aquatic habitats for wildlife species would not occur at this time. Gullied stream banks would continue to erode, resulting in the continued loss in quality and quantity of riparian and aquatic habitats. Because there is no grazing in the project area, cumulative effects from agriculture are the same under either alternative. Cumulative effects from reasonably foreseeable treatments on private land associated with the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area in the long term, and a minimal short term impact to macroinvertebrates, which are prey for Pacific pond turtle, greater sandhill crane, willow flycatcher, pallid bat, Townsend's big-eared bat, and western red bat. Because this effect is minimal in the context of the analysis area, the determination of effects for these species under No Action is "Will Not Affect." There would be no effect to bald eagles under this alternative because there would be no potentially disturbing construction activities. Also, No Action "Will Not Affect" other species listed in Table 4: foothill yellow-legged frog, Sierra Nevada yellow-legged frog, great gray owl, spotted owl, and goshawk because they do not occur in the analysis area.

### **Direct, Indirect, and Cumulative Effects to Management Indicator Species**

For macroinvertebrates, the analysis of effects is in terms of stream flow, sedimentation and surface shade. The No Action Alternative would likely not change flow, sedimentation, or stream shade from existing condition and trend. Sedimentation is likely to continue to be generated by receding gully walls and the amount of shade is not likely to change. Gullied stream banks would continue to erode, resulting in the continued loss in the quality and quantity of riparian and aquatic habitats. Cumulative effects from other activities would continue in current trends. Proposed bank stabilization and fish passage activities are likely to continue to be implemented on private land within the analysis area. Therefore, the cumulative effects of these activities (reduced sedimentation and increased shade) would still occur under this alternative in the analysis area, but not directly in the project area.

For yellow warbler, the analysis of effects is in terms of the change in acreage and quality of riparian habitat. This alternative would result in no change to the existing trend of riparian habitat vegetation development on the gravel bar, and further loss of habitat and bank erosion on the opposite bank. Cumulative effects from grazing would be the same under either alternative. Under this alternative, cumulative effects to montane riparian habitat would only increase 0.2 acres instead of 0.3 acres within the analysis area (see Table 7), due to the implementation of other bank stabilization and fish passage activities associated with the Integrated Greenhorn Creek Restoration Project, and No Action in the Reid/PNF Treatment Unit.



## ***Proposed Action Alternative***

### **Direct, Indirect, and Cumulative Effects to TES Species**

The Proposed Action would not directly or indirectly affect the Sierra Nevada yellow-legged frog, nor foothill yellow-legged frog because neither species occurs in, or within six miles of, the analysis area. Therefore, there is a “Will Not Affect” determination for these species. Please refer to the wildlife BABE for further analysis.

The Pacific pond turtle has been known to occur within the analysis area, however this species was not detected during 2010 surveys. Mitigation to protect turtles includes re-surveying the project area prior to construction to avoid directly crushing individuals with heavy equipment. Turtles may also benefit in the long term from the Proposed Action, with an increase in basking sites on the newly sloped bank and on the vane boulders. The turtle would be negatively indirectly affected in the short term by a short term decline in macroinvertebrate prey, and would indirectly benefit in the long term, due to less sedimentation that is expected to benefit macroinvertebrate populations. Cumulative effects to the turtle would be an extension of the direct and indirect effects discussed above, with the reasonably foreseeable treatments in the five other polygons associated with the Integrated Greenhorn Creek Restoration Project. These effects result in a “May Affect” determination.

While the habitat does meet typical foraging habitat characteristics, bald eagles have been observed within the analysis area, and it is likely that they use the analysis area for infrequent foraging. There is no nesting habitat within or near the analysis area. There is a potential for direct disturbance under the Proposed Action to foraging bald eagles due to noise and equipment movement during construction. The effect is likely to be minimal considering the expanse of the valley surrounding Greenhorn Creek, and the length of Greenhorn Creek, however it does result in a “May Affect” determination for bald eagle.

There is no foraging or nesting habitat within or near the analysis area for the northern goshawk and the spotted owl. The open meadow within the analysis area provides foraging habitat for great gray owl. The project would not affect forested habitat on which these species depend. None of these three species are not known to exist in or near the analysis area. Therefore there is a “Will Not Affect” determination for these three species. Please refer to the wildlife BABE for further analysis.

There is willow flycatcher (WIFL) habitat within the analysis area and within the Reid/PNF Treatment Unit. No WIFL were detected during field surveys. However, because of the suitable habitat, mitigation would include re-surveying habitat within ¼ mile of the project area before construction to ensure that no individuals are present that could be directly disturbed by construction activities OR construction would begin after the WIFL limited operating period (LOP), which ends August 31 (to ensure that the young have fledged the nest). If WIFL are detected during surveys, construction would be delayed until after the LOP. Direct impacts to individuals would be avoided with this mitigation, although it is possible that individuals could be missed during a survey. Short-term direct impacts to habitat include uprooting willow plants with heavy equipment during construction to re-plant on the floodplain bench on the treatment bank. Short-term indirect impacts to habitat include the temporary reduction (less than six months) in

macroinvertebrates. WIFL feed on winged adult macroinvertebrates. This would be a minimal impact because of the small area of disturbance (390 feet of channel and 1.2 acres) in the context of 3.9 miles of channel in the analysis area. In the long term, the reduction in sediment due to the Proposed Action is expected to improve habitat for macroinvertebrates, thereby indirectly benefitting WIFL.

Cumulative effects to WIFL would include on-going cattle grazing within the analysis area and reasonably foreseeable future bank stabilization and fish passage projects on private land associated with the Integrated Greenhorn Creek Restoration Project. The primary land use in the analysis area is grazing. Cowbird nest parasitism is known to negatively impact willow flycatcher reproduction. Grazing would continue to occur in the analysis area under either alternative, thus the Proposed Action would have no effect on this cumulative effect.

Reasonably foreseeable future bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct and indirect effects from the 1.2 acre, 390 foot channel treatment to a total of 21.3 acres, and 1.3 miles of stream channel treatment. Within the context of the entire 404 acre analysis area, this cumulative effect would be minimal in the short term, as construction would occur over at least two years, and only occur in five percent of the total analysis area, and 33% of the 3.9 total channel miles. The proposed treatments in the Integrated Greenhorn Creek Restoration Project are expected to be cumulatively beneficial in the long term, with an expected measurable decrease in sedimentation from all of the proposed treatments. This would cumulatively improve habitat for macroinvertebrates, and benefit WIFL that feed upon them. Because of the direct, indirect, and cumulative effects just discussed, there is a “May Affect” determination for WIFL.

Sandhill cranes are known to occur, and have nested, within the analysis area. They are sensitive to human disturbance and grazing activity during nesting. To avoid direct impacts to individuals, mitigation includes either constructing the project outside of the Limited Operating Period (LOP), which is after August 1, or surveying for cranes within a half-mile of the project area to determine presence and location prior to any disturbance. If cranes are detected, construction would either be delayed, or it would proceed on schedule if it were determined by a biologist that the cranes could be avoided. With this mitigation measure, there should be no direct impact to individuals, however, it is possible that individuals could be missed in a survey. Since sandhill cranes utilize wet meadow areas, they are not likely to use the gullied channel environs for foraging, and it is unlikely that the Proposed Action would have an indirect effect on sandhill cranes. While grazing activity can pose a cumulative impact to sandhill cranes in the analysis area, the grazing also helps to maintain the open meadow space preferred by sandhill cranes. Grazing does not occur within the Red/PNF Treatment Unit, but would continue to occur in the analysis area under either alternative, thus the Proposed Action would have no effect on this cumulative effect. Reasonably foreseeable bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct effects. A LOP and/or pre-construction surveys are also recommended for these treatments, thus minimizing this potential effect to individuals. Because of the effects discussed above, there is a “May Affect” determination for sandhill cranes.

Pallid bat, Townsend's big-eared bat, and western red bat are all Forest Service sensitive species, and are known to occur in Plumas County. Detection of these species is difficult, and while project-specific surveys were not completed, it must be assumed that sensitive bat species occur within the analysis area. Roosting habitat does not occur within the analysis area. Pallid bats prefer caves, crevices, mines, or occasionally, hollow trees or old buildings. Townsend's big-eared bats are known within one mile west of the analysis area. The ponderosa pine forests surrounding the analysis area can provide habitat for this species, but this habitat is not within the analysis area. Large cottonwoods and other large riparian trees that would be preferred by western red bats do not occur in the entrenched riparian area within the analysis area. Trees within the entrenched channel tend to be smaller in diameter than trees preferred by this species. Western red bats are known to occur 25 miles east of the project area, but not in American Valley.

Because these bats can have a wide range, the Proposed Action has a potential for short-term, temporary disruption of riparian foraging, commuting, and roosting habitat for each of these species during construction due to heavy equipment noise and movement. However, this type of disturbance, (which occurs during daylight hours, when foraging is not occurring), is expected to be minimal. There would be no long term disturbance to potential roosting habitat because trees would not be affected by the project. The Proposed Action remains within the immediate area of the gullied stream channel. Adult winged macroinvertebrates are an important food source for these bat species. As discussed above, species that rely on this food source would be temporarily indirectly affected by a reduction in macroinvertebrates due to construction. This effect is expected to be minimal due to adjacent areas that would not be affected by the Proposed Action. Bats can fly and have unusually large home ranges for their size and are able to utilize multiple habitat settings for different purposes. In the long term, bats would indirectly benefit from the Proposed Action because of the decreased sedimentation that would benefit macroinvertebrate populations.

The primary land use, grazing, does not appear to affect bats, thus there would be no cumulative effects due to grazing. Reasonably foreseeable bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct and indirect effects from the 1.2 acre, 390 foot channel Reid/PNF Treatment Unit to a total of 21.3 acres, and 1.3 miles of stream channel treatment. Within the context of the entire 404 acre analysis area, this cumulative effect would be minimal in the short term, as construction would occur over at least two years, and only occur in five percent of the total analysis area, and 33% of the total channel miles. The proposed treatments in the Integrated Greenhorn Creek Restoration Project are expected to be cumulatively beneficial in the long term, with an expected measurable decrease in sedimentation from all of the proposed treatments, thus improving macroinvertebrate populations on which bats feed. Because of the direct, indirect, and cumulative effects just discussed, there is a "May Affect" determination for all three bat species.

### **Direct, Indirect, and Cumulative Effects to Management Indicator Species**

For macroinvertebrates, the analysis of effects is in terms of stream flow, sedimentation and surface shade. The Proposed Action would not affect flow, because flow would completely bypass the project in the short term during construction. In the long term,

laying back and vegetating stream banks does not affect stream flow. Pool habitat to be constructed by the project would incrementally slow flow velocities down, and velocities would increase over the boulder vanes, thus there would be no affect to overall streamflow timing. The project would not affect the hydrology of the project area. Sedimentation may increase in the short term during project construction, however BMP's will ensure that sedimentation due to construction will be minimized. In the long term, sedimentation is expected to decrease through the project area because the eroding gully walls would no longer contribute excessive sediment. The reduction of excessive sediment/bedload would also help stabilize channel geometry by not building gravel bars at the current rate. The Proposed Action is expected to increase surface shade along the channel, due to the planting of vegetation on the eroding bank.

No agricultural activities occur in the project area, therefore there would be no cumulative effects from these activities. The Proposed Action on the Reid/PNF Treatment Unit is similar to bank stabilization and fish passage activities planned in five other treatment units on private land. There is a potential that construction in all six of these areas combined could affect water quality and aquatic life in Greenhorn Creek in the short term (less than 6 months). Potential cumulative effects from all proposed activities in the Integrated Greenhorn Creek Restoration Project include increased siltation during construction, and decreased aquatic macro-invertebrate production in the short term (less than 6 months). The following practices are included in the Proposed Action, and on all of the proposed treatment units to minimize these potential disturbances:

- routing stream flow around the work area, using a temporarily constructed bypass channel, and straw/plastic dams upstream and downstream of the work area
- pumping water that seeps into the work area out of the channel, and onto vegetated floodplain
- deployment of Sedimats® to capture settleable solids for removal from the channel onto bank areas. Once the work is completed, the straw/plastic dams would be removed, and the temporary bypass channel filled to original grade. Sedimats would be removed from the channel, and placed on streambanks where they would aid in stabilization.

In the long term, the expected reduction of sediment due to the Proposed Action in the context of other treatments in the Integrated Greenhorn Creek Restoration Project is expected to benefit macroinvertebrate habitat through the reduction of sedimentation, increased shade on sloped and vegetated banks, with no cumulative effect to flow since the hydrology of the channel would not be affected by any of the proposed activities.

For yellow warbler, the analysis of effects is in terms of the change in acreage and quality of riparian habitat. Direct effects to habitat include the removal of willow plants located on the bar, and re-planting of these plants on the opposite eroding bank. Also, the choke cherries on the top of the eroding bank would be removed in order to lay the bank back. Survival of willows has been excellent (approximately 90%) in similar projects on Spanish Creek and Wolf Creek. The potential survival of removed choke cherries to be re-placed on the upper edge of the sloped bank is not known. The gravel bar would be planted more sparsely than currently exists, so that high flows can easily access and spread across the gravel bar, thus reducing the erosive force of water in the channel. In

the short term (1-3 years), the project would increase vegetation on the eroding bank, and decrease vegetation on the gravel bar, thus altering the existing forces of resistance within the project area. This re-arrangement of vegetation is expected to allow the vegetation on the newly sloped bank to take hold and develop strong roots. In the long term, vegetation on both banks is likely to equalize. By the time vegetation becomes more resistant on the gravel bar (3-5 years), it is expected that the opposite bank will have enough root strength to withstand the forces of flowing water. Acres of riparian habitat, canopy cover, and tree size class would remain the same, however, the location of these habitat features would change from the gravel bar and top of the eroding bank, to the newly sloped bank.

Within the analysis area, the cumulative effects to montane riparian habitat are agricultural grazing and foreseeable future bank stabilization and fish passage projects. Depending on many grazing management factors, grazing can impact the species composition and size classes of riparian vegetation. Most of the riparian areas along Greenhorn Creek are developing stabilizing vegetation, and it appears that current grazing management has a minimal negative effect on riparian habitats. Grazing does not occur within the project area, therefore cumulative effects to montane riparian habitat from grazing would be the same under either alternative. Cumulative effects associated with proposed bank stabilization and fish passage structures on private land would be extended into the project area under the Proposed Action. Within the analysis area, the direct and indirect effects discussed above would extend into 1.5 acres of montane riparian habitat in the other proposed treatment polygons, and would result in an increase of 0.3 acres to a total of 1.8 acres of montane riparian habitat, due to the increase of habitat on newly sloped banks.

## HYDROLOGY

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Greenhorn Creek is a major tributary to Spanish Creek (Hydrologic Unit Code 5 #1802012207). Several watershed and landscape analyses have been conducted within the Spanish Creek watershed, including: the *East Branch North Fork Feather River: Spanish Creek and Last Chance Creek Non-Point Source Water Pollution Study* (1992); the *East Branch North Fork Feather River Erosion Control Strategy* (1994); and the *Landscape Analysis of Watersheds 23 & 24* (Mt Hough Ranger District 1997). Much of the watershed-wide information below is derived from these reports.

### Affected Environment

Greenhorn Creek is a 44,695 acre (70 mi<sup>2</sup>) watershed, with 45 inches of average annual precipitation. The 1994 study found that of the 273 miles of stream channel in the watershed, 153 miles are in fair to poor condition and in an eroding condition. Of those channel miles, 19 total miles are a C-type channel (i.e. a slope and form similar to the reach through the analysis area), with 13 of those miles (68%) in an eroding condition.

In 1991, the FR-CRM undertook a stream and fish habitat restoration project on 0.75 miles of Greenhorn Creek within the analysis area. That work consisted of meander re-alignment using boulders, log revetments, and revegetation. High flows and sediment load in 1995 re-configured the channel once again, causing the abandonment of many of the structures. In 2001, boulder vanes were installed within a portion of the previously

treated area above Highway 70. Boulder vanes have proven to be a successful technique when treating eroding banks that must remain within the confines of an existing entrenchment, and the boulder vanes continue to work as designed in the Farnworth polygon. (Proposed work associated with the Integrated Greenhorn Creek Restoration project would extend that vane treatment further downstream.)

In 1999, the FR-CRM established a long-term monitoring reach on Greenhorn Creek, following the Stream Condition Inventory (SCI) protocol developed by Region Five of the US Forest Service. The reach is located just above the confluence of Greenhorn Creek with Spanish Creek. Geomorphic, water quality, and biological data were collected in 1999, 2001 & 2003. The following discussion is excerpted from the FR-CRM's 2003 Watershed Monitoring Report:

Geomorphic changes at this site include a barely perceptible increase in average bankfull width, and corresponding increasing width to depth ratio. Entrenchment, however, is steady. The pool to riffle ratio and residual pool depth is also steadily increasing, and substrate particles decreasing in size, all of which point to some changes taking place that warrant continued monitoring. The slope was the same from 2001 to 2003, and perhaps the change from 1999 is due to a survey error (this is the first site that is surveyed each year). There was a general improvement in temperatures (i.e. cooling) from 2001 to 2003, as expected with the increased flows. Greenhorn temperatures are marginally good for trout, and water quality at this site was low in nutrients. No metal concentrations were above water quality standards, or particularly noteworthy. Bacteria could be a concern, with this site tied with the neighboring Spanish Creek site for the 3rd highest concentration of fecal coliform in 2003. Random turbidity monitoring showed an expected increase in turbidity from just above American Valley to this site at the mouth. Fish productivity followed the flow trend, increasing in productivity from 2001 to 2003.

Average pooltail fines were 31, 33, and 6%, respectively in each of the three years. Pooltail fines below 10% are preferable for trout spawning, and the 2003 measurement shows a dramatic improvement. Measurements have not been taken since 2003, but are planned for 2011. More frequent storm-related turbidity sampling has occurred since 2002, involving numerous volunteers. Results from this anecdotal sampling effort indicate that average turbidity increases in Greenhorn Creek through American Valley by over 100%, as measured over a variety of flows. At approximately bankfull or higher flows, the average increase in turbidity is 150%.

Two storm-related in-depth water quality sampling efforts were conducted in spring 2010 along Greenhorn Creek from the upper crossing under Hwy 70, to the mouth. The purpose of the sampling was to try and identify potential water quality-related limiting factors for the trout population in Greenhorn Creek. Results of the sampling showed that Greenhorn Creek was within all water quality standards, except for one high aluminum reading at the uppermost site. It was determined that the resources were not currently available to conduct a more thorough sampling effort (i.e. more sampling points, and more samples collected during more storm events), but it does appear from these two measurements that water quality from storm-generated run-off is not a limiting factor for trout production in Greenhorn Creek.

The Reid/PNF Treatment Unit encompasses 390 feet of stream bank along Greenhorn Creek. In 2007 and 2008, several landowners approached the FR-CRM with concerns over bank erosion. In response, the CRM contacted all of the landowners along Greenhorn Creek, who supported the development of a comprehensive plan to address bank erosion along the channel. The analysis area was determined, and the CRM sought and was awarded planning funds from Title III of the Secure Rural Schools and Self-Determination Act to assess the potential for restoration. The following is excerpted from the final report from that effort (Plumas Corporation 2009):

The segment of Greenhorn Creek running through American Valley provides irrigation water to six livestock and hay producers. Within the survey area there are three irrigation diversion dams along the channel, one at Highway 70, one mid-valley at the Shea Ranch, and one at the upper end of the Bresciani Ranch. There are also five road crossings. These dams and road crossings have, and continue to, exert considerable influence on channel dynamics. The channel has also been manipulated in several sections.

At present, the irrigation dams act to hold the bed at a pre-degradation elevation. However, while they have a significant stabilizing force on upstream segments of the channel, they are also now impassable to fish, due to the downcut streambed below each dam. All three dams are fairly old and the upper two are in danger of collapse. A dam collapse would cause major channel adjustment, with deposition below each dam, and head-cutting in the upstream direction. The elevation drop is 7.4 feet at Highway 70 and 9.0 feet at the Shea dam. The drop at the Bresciani dam is 1.5 feet.

The road crossings constrict high flows, creating backwater effects, which induce bedload deposition (bar formation) upstream. Consequently, bank erosion opposite of these developing bars accelerates as the gully widens to accommodate the developing meanders.

Historic channel straightening activities have contributed to the existing down-cut condition. Some of these straightened sections of channel now have some of the most locally stable banks along Greenhorn Creek. This temporary situation has led to the common, but erroneous, conclusion that straightening a channel leads to stability. In fact, most straightened channels eventually require stabilization work. In Greenhorn Creek, channel straightening has led to down-cutting, and attendant subsequent adjustments such as widening to accommodate the slope, bedload transport and floodplain that are all necessarily parts of what we call a “stream channel.

Relatively strong riparian vegetation and very cohesive soils have allowed many banks to re-vegetate since the last significant flood event. The recent drought has also allowed vegetation to propagate and thrive without the undue stress of frequent high flows. This stabilizing trend is

likely to continue until the next big event. At that time, the recovery/revegetation process will be truncated as more bedload enters the system, and the gully widens at any weak point to accommodate both the bedload and the flood waters. Then the recovery/revegetation process would re-start

Water temperatures were successfully measured in Greenhorn Creek above American Valley, at the Massack gage, and at the mouth of Greenhorn Creek, above its confluence with Spanish Creek in 2009. In general, water temperature increases approximately 9°F as Greenhorn Creek flows through American Valley. In 2009, there was a nine degree increase in daily average, daily maximum, and weekly average water temperatures. Diurnal fluctuation was approximately the same at both stations.

The warming of water traveling through American Valley can have an influence on trout production. At Massack, above the valley, the daily average temperature did not exceed 68°F, whereas 32 days at the confluence had an average temperature above 68°F. About 29% of the time from mid-May to the beginning of September, the temperature was above 68°F at the mouth. Temperatures above 68°F are not conducive for trout production. Short term temperatures above 75°F can be lethal. At Massack, there were 0 hours with temperatures above 68°F, and 3 hours with temperatures above 75°F at the mouth.

Temperatures appear to be conducive for trout in some places through American Valley, and not in others. Continued monitoring should help narrow the sources of warming water temperatures through American Valley; however, lack of shade along sections of channel with eroding banks, and shallow areas associated with recently deposited gravel are likely sources of warming.

In 2007 and 2008, 39 channel and valley-wide cross-sections, and a longitudinal profile were topographically surveyed. Cross-section graphical displays and locations can be found in the report excerpted above. Cross-section Reid1 was located within the Reid/PNF Treatment Unit. Based on this cross-section, existing bankfull width is 56 feet, and bankfull area is 132 square feet. The slope in the project area is 0.4%. Compared to other cross-sections, it appears that the 320 foot wide gully at this location may be sufficient to accommodate flood flows. Active gully widening at this location is likely due to the aggrading gravel bar on the opposite bank.

The following table displays flow frequency estimations, based on calculations using the slope-area method, and least squares at Hwy 70, then extrapolated downstream to the project area, with a 152% greater watershed area.

**Table 9. Flow frequency Estimations for the Reid/PNF Treatment Unit.**

Return Interval (years)	Estimated Flow (ft <sup>3</sup> /second)
1.5 ("bankfull")	760
2	1,064
5	2,736
10	4,256
25	6,688
50	9,120
100	10,640



## **Environmental Effects**

Environmental effects to water resources for this project are discussed in terms of sedimentation, channel characteristics, water temperatures, and fisheries.

### ***No Action – Direct and Indirect Effects***

The No Action Alternative would maintain existing conditions. The primary source of sedimentation in the analysis area under current conditions is on-going erosion of the walls of the entrenched channel. This erosion also contributes excessive gravel to the system, resulting in gravel bar aggradation that leads to further widening of the entrenchment. As the entrenchment progresses deeper and wider, erosion is likely to continue until a resistant bed is reached, and an adequate floodplain width (that can accommodate flood flows and bedload) is reached at the new, lowered elevation. Depending on the reach, the stream channel in the analysis area is generally in good to poor condition with an unstable bed and unstable banks, contributing to accelerated channel erosion in some areas, and a trend toward stability in other areas.

Under the No Action alternative, eroding banks would continue to slough off and remain in a vertical configuration. Vertical banks do not support vegetative colonization, and so temperature-moderating shade is unlikely to expand much under this alternative. Likewise, the gravel that is contributed to the channel from the eroding banks is likely to maintain unstable shallow areas that continue to absorb warming solar energy.

While gravels contributed to the channel from eroding banks can provide trout spawning substrate, the accompanying fine sediments may render those gravels unfit for successful spawning. Fine sediment measured at the mouth of Greenhorn Creek was approximately 30% in 1999 and 2001, and dropped to 6% in 2003. Fine sediments have not been measured in the project area. Based on the SCI data, it appears that under the No Action alternative, fine sediments would continue to be episodically generated as pieces of bank break off, become suspended in the stream flow, and eventually deposited in the stream bed. Cover for trout is an important habitat component, and is limited in the project area, with no overhanging bank or pool habitat. This condition would remain the same under the No Action alternative.

### ***No Action – Cumulative Effects***

The project area is excluded from grazing, but grazing does occur within the 404 acre analysis area. Cattle are fenced from the channel in some areas along the channel, and the cumulative effect to water resources of grazing is localized. Also, because the analysis area is irrigated, cattle do not tend to concentrate along the stream channel. The cumulative effects to the project area from grazing are minimal, and would remain so under either alternative. Bank stabilization and fish passage activities on private land associated with the Integrated Greenhorn Creek Restoration Project would likely still occur under this alternative. Cumulative effects to water resources under this alternative from these activities could include increased short term sedimentation from construction, and a long term decrease in sedimentation from treated eroding banks; decreased water temperatures from decreased deposition and increased shade; and improved channel stability and fisheries. These effects are explained further below under the Proposed Action, as the treatments are similar.

### ***Proposed Action – Direct and Indirect Effects***

Potential impacts of the Proposed Action on water resources include: sedimentation, water temperature, channel geometry, and fisheries. As mentioned above in the discussion of effects to macroinvertebrates, the Proposed Action would not affect flow (and therefore not affect water rights), because flow would completely bypass the project in the short term during construction. In the long term, laying back and vegetating stream banks does not affect stream flow. Pool habitat to be constructed by the project would incrementally slow flow velocities down, and velocities would increase over the boulder vanes, thus there would be no affect to overall streamflow timing. The project would not affect the hydrology of the project area. Direct effects on sedimentation include a potential short term increase due to construction. Such direct negative impacts would be minimized by following mitigation measures described in the Description of the Alternatives section of this document, and by following Best Management Practices, listed in Appendix A). Sedimentation is expected to be directly reduced in the long term by the Proposed Action because the eroding gully wall would no longer contribute excessive sediment. In turn, by removing gully wall recession as a source of excessive fine sediments and gravels, the Proposed Action would indirectly help stabilize channel geometry by reducing the rate at which gravel is deposited on bars. Excessive deposition on gravel bars can lead to erosion of the opposite bank, as is now occurring in the project area. The Proposed Action would directly affect channel geometry with the installation of the boulder vanes that will result in pool habitat where there is now relatively shallow run or riffle habitat. The Proposed Action is expected to indirectly decrease water temperatures over time as shading vegetation from plantings on the treated bank matures to shade- producing size. Coldwater fisheries depend on the habitat parameters just described, and as those habitat features improve, fisheries would be expected to improve as well. Less sedimentation should improve spawning habitat quality, resulting in better survival of eggs. Cooler water temperatures (i.e. remaining below 68°F) are more conducive to trout production than are higher temperatures, thus an increase in shade should indirectly improve trout habitat by keeping temperatures cool. Likewise, the stabilized channel geometry should allow for the long term development of overhanging bank habitat, which can be an important cover component for trout. Pools associated with the boulder vanes could also improve habitat by providing cover near the boulders, and cold water near the bottom of the pools.

### ***Proposed Action – Cumulative Effects***

Cumulative effects from agriculture are basically the same under this alternative as they are under the No Action alternative. The Proposed Action would increase the cumulative effects of the other fish passage and bank stabilization activities, because the Proposed Action also is a bank stabilization activity. It is unlikely that the Proposed Action, implemented by itself, without the other five treatment units proposed in the Integrated Greenhorn Creek Restoration Project, would produce measurable reductions in sedimentation, water temperature, or increased channel stability in the analysis area. However, in combination with the other treatments, these parameters are likely to be measurably improved. Fishery improvements are likely to be measurable within the

project area because of the pool habitat formed by the boulder vanes (i.e. fish are expected to occupy the pools), and the Proposed Action is expected to enhance cumulative effects on fisheries of other bank stabilization and fish passage projects.

## **SOILS**

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### **Affected Environment**

Greenhorn Creek and its environs through American Valley are geologically comprised of sedimentary and metasedimentary rocks, specifically, Quaternary alluvium and Paleozoic marine. Durrell (1987) describes American Valley as having once been a lake resulting from the damming of Spanish Creek. The dam was caused by movement of a fault located at the base of Grizzly Ridge between Spring Garden and Keddie. The valley lies in the Plumas Trench between the Sierra Nevada ridge and Grizzly Ridge.

The basin is complexly faulted and must be composed of many fault-bounded blocks. The hills in the central part of the valley are the tops of high blocks that stood as islands in the lake. The outline of the basin, like that in Indian Valley is that of a drowned stream system with arms that extended up Spanish, Greenhorn, and Thompson creeks.

The orographic crest of the Sierra Nevada range is less than 10 air miles northeast of the project area, and defines the Greenhorn Creek watershed boundary. Average annual precipitation in the analysis area is 45 inches with 16 inches of run-off. The bulk of annual precipitation falls as snow from Pacific frontal systems during the winter (October- May) with a dry summer. Major watershed scale floods are the result of long duration, intense, rain-on-snow, storm events (1955, 1986, 1997).

The 1.2 acre project area is located at the bottom of a 42,226 acre watershed. Elevation in the watershed above the project area peaks at 7,779 feet. The elevation of the project area is approximately 3,500 feet. Along ridgetops and steep side slopes, boulders and rock outcrops dominate the landscape. The soil type within the project area is Greenhorn Series. The valley slope within the project area is 0.4%. Before degradation, the meadow surface was the floodplain of Greenhorn Creek, with overbanking flows occurring with a frequency somewhere between 2-10 years. The meadow was a moist to wet riparian area floodplain with stable soils, anchored by wet or mesic vegetation complexes with deep, dense root systems and excellent infiltration. In the current condition, the channel has degraded to an elevation eight feet below the meadow surface. Only the most infrequent flood flows can access the now-abandoned meadow floodplain. The northeast bank is characterized by a vertical slope, with on-going bank sloughing. Near the downstream end of the project area, a mid-channel bar is forming just beyond the base of the northeast bank. The southwest bank is characterized by a large, partially vegetated gravel bar. A new floodplain is forming at the lower elevation on the south side of the channel, and is characterized by overflow flood channels, riparian shrubs, and a large gravel bar.

Systemic channel incision has severely impacted the functionality of the meadow floodplain and moisture characteristics of soils along Greenhorn Creek in the project area, as well as throughout the 404 acre analysis area. Soil moisture is currently managed for agricultural productivity with irrigation.

## Soil Characteristics

The Soil Resource Inventory (USDA Forest Service, Plumas National Forest 1988) describes the soil type within the Reid/PNF Treatment Unit project area as Greenhorn Series, which consists of very deep, poorly drained soils on floodplains, formed in mixed alluvium weathered from predominately metasedimentary rocks and hydraulic mine tailings. Within the project area, soils stratify from the surface to 60 inches as loam, down to fine sand to loam, and to silt loam. In descriptions for water management for this soil, it is noted that cut banks can cave in.

Permeability of the soil is moderate. Available water capacity is high. Effective rooting depth is 20-30". Run-off is slow, and the hazard of water erosion is slight. A seasonal high water table is at a depth of 20-30" from December through May. This soil is subject to flooding in 3 out of 10 years for brief periods from December through March.

This unit is used for irrigated hay and pasture.

If this unit is used for hay and pasture, the main limitations are poor drainage and flooding. Wetness limits the choice of plants and the period of cutting or grazing. Flooding should be considered before any capital improvements are installed. The risk of flooding can be reduced by the use of levees. Irrigation water needs to be applied carefully to avoid raising the water table.

This soil is fair to poor for grain and seed crops, grasses and legumes, and good for wild herbaceous plants and wetland plants.

**Table 10: Characteristics of soils within the analysis area (Soil Resource Inventory, USDA-Plumas NF, 1988).**

<i>Soil Type</i> (and map unit number)	<b>% of analysis area</b>	<b>% of Reid/PNF unit</b>	<i>% of other treatment units</i>	<b>erosion factor (K*)</b>	<b>pH</b>
Greenhorn (23)	75%	100%	85%	0.32-0.43	6.1-7.3
Keddie (24)	17%	0	10%	0.32	6.1-7.3
Plumas (32)	5%	0	5%	0.15	6.1-7.3
Massack (30)	2%	0	0	0.32-0.37	6.1-7.3
Riverwash (36)	1%	0	0	Not analyzed	Not analyzed

\* K indicates the susceptibility of a soil to sheet and rill erosion by water, ranging from 0.05 to 0.69, the higher the K factor, the more the soil is susceptible to sheet and rill erosion by water.

For considering cumulative effects to soils, the two other soils that would be impacted by proposed project activities in the analysis area associated with the Integrated Greenhorn Creek Restoration Project are the Keddie Series, and the Plumas Series. Since neither the Massack Series and nor Riverwash would be impacted by the Proposed Action or other foreseeable future actions on private land associated with the Integrated Greenhorn Creek restoration Project, they will not be discussed further. Similar to the Greenhorn Series, the Keddie Series also consists of very deep, poorly drained soils on floodplains and alluvial fans, formed in mixed alluvium. It consists of loam on top, stratified down to

sandy loam to clay loam. The Plumas series consists of very deep, well-drained soils on alluvial fans, formed in mixed alluvium, predominately from metasedimentary rocks. It consists of very gravelly sandy loam on top, stratified down to extremely gravelly loamy sand. Similar to the Greenhorn series, both of these soils are fair to poor for grain and seed crops, grasses and legumes, and good for wild herbaceous plants and wetland plants. As mentioned above, with the incision of the Greenhorn Creek channel, moisture characteristics of all of these soils has been altered so that flooding is less frequent, and drainage is increased. Grasses are commonly grown by agriculturalists under current conditions with the use of irrigation.

## Soil Productivity

Three criteria used for indicating the impacts of land management activities on soil productivity include the annual rate of soil loss, the porosity of the soil, and the maintenance of organic matter within the soil. Soil productivity is the inherent capacity of a soil resource to support appropriate site-specific biological resource management objectives, which includes the growth of specified plants, plant communities, or a sequence of plant communities to support multiple land uses (USDA Forest Service 2010). Invertebrate, microbial, and fungal populations comprise soil biota and are key to nutrient recycling and soil productivity.

### *Soil Productivity - Annual Rate of Soil Loss*

Within the project and analysis areas, the primary process for soil erosion is lateral gully wall migration that is associated with flowing water and excessive bedload deposition on gravel bars. Existing effective soil cover on meadows within the project area, as well as the entire analysis area is estimated at greater 70%, which is within PNF LRMP guidelines for effective soil cover.

Functional alluvial channel/floodplain systems are, by definition, net depositional landscape features. By serving as flood flow spreading and dispersal areas, water velocities of sediment-laden flows decrease, thus allowing sediments to deposit. Under the existing condition, with the incised channel, the depositional function is no longer occurring on the historic floodplain meadow feature. Streambanks are eroding at accelerated rates, resulting in transportation of those sediments downstream. The meadow floodplain is no longer accessible to spread flood flows and initiate deposition. In the absence of long-term site specific bank erosion studies (i.e. bank erosion pins), the typical methodology for calculating long-term bed-and-bank erosion rates of entrenched channels is to quantify the 'void' represented by the gully and extrapolate over a given time period. The following table summarizes gully and valley-wide cross-sections surveyed throughout the analysis area. It is generally accepted that most of the present entrenched channels have incised within the last 100 years. The net void (including gravel bar aggradation) within the project area (cross-section Reid1) is approximately 1,840 sq ft, multiplied by 390 feet of bank is 26,578 cubic yards, divided by 100 years is approximately 266 cubic yards per year.

**Table 11. Channel and gully dimensions in the analysis area. All units are in feet.**

Cross-section	bankfull width	bankfull area	gully width	gully depth
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<b>Cross-section</b>	<b>bankfull width</b>	<b>bankfull area</b>	<b>gully width</b>	<b>gully depth</b>
frn1	57	93	100	6.1
frn2	79	198	98	5.55
0-A	41	127	196	10.62
1	45	117	165	11.13
1-a	21	44	90	10.5
Porter	46	139	130	9.4
blw Mill-Nick bridge	36	65	75	9.45
thon-miller	58	121	202	7.2
Lower Thon	87	231	178	6.2
DS of Thompson	40	77	166	5.7
CLIns-Jcby	48	66	342	4
Reid1/Plumas N.F.	56	132	320	8.8
Reid2	76	142	353	9
Reid3	36	86	148	4.8
Reid4	38	65	245	5
Reid5	40	116	130	6.5
Reid6	40	52	100	5.8
UpValley	46	135	108	11.03
12	57	81	133	6.3
LoValley	38	96	71	6.6
Labbe	70	216	90	4.33
Span-Grnhrn	43	126	75	4.56
Bresciani	30	39	61	7

### *Soil Productivity - Porosity*

Soil porosity is the volume of pores in a soil that can be occupied by air, gas or water. Porosity varies, depending on the size distribution of the particles and their arrangement with respect to each other. Soil compaction increases the bulk density and decreases the porosity of soils. Compaction can slow plant growth and impede root development. Soil compaction restricts percolation and can cause poor water infiltration, potentially resulting in increased overland flow during high precipitation events. Compaction increases soil strength, potentially causing vegetation to use more energy to access nutrients and water, resulting in a decline of above ground plant growth.

Results of the North American Long-Term Soil Productivity Study, summarized for study sites with at least 10 years of response, indicate that the effect of compaction on biomass productivity differs primarily depending upon the soil texture (Powers et al 2005). Reduced biomass productivity was observed for soils with high clay content. However, compacted sandy soils actually indicated increased biomass productivity. No significant change in biomass productivity was indicated for loamy soils. Loam is the primary texture of soils within the project area and analysis area, with little clay. Therefore, it is not likely that significant biomass productivity has been lost due to compaction under existing conditions in the project area or analysis area

### *Soil Productivity - Organic Matter and Soil Nutrients*

Organic matter is the cache for plant nutrients and is the primary source of plant-available nitrogen, phosphorus and sulfur. Organic material includes plant litter, duff, and woody material. Meadow sod and accumulated litter moderate soil temperature and moisture, providing an environment favorable for the soil biota that recycle plant and animal remains. Surface organic material also protects soils from erosion, and enhances infiltration and hydrologic function. Observations of soil cover greater than 70% within the project area and analysis area ensures that there is adequate organic matter and associated nutrients under existing conditions.

### *Buffering Capacity of the Soil*

Buffering capacity refers to the soil's ability to resist a significant change in pH, or acidity. The cation exchange capacity of soils gives them most of their buffering capacity. Typical pH levels for the soil types in the project area are listed in Table 10 above. Acidity levels within the project and analysis area are relatively neutral, and are likely able to resist significant changes.

## **ENVIRONMENTAL EFFECTS**

### **Annual rate of soil loss**

#### ***No Action Alternative***

This alternative would likely maintain the existing average soil loss rate of 266 cubic yards per year until an adequate floodplain area is eroded away at the lowered elevation. Cumulative effects from livestock grazing would not affect soil loss in the project area under either alternative, since there is no livestock grazing in the project area. Due to the loamy nature of the soil, and good soil cover, it is not likely that livestock grazing would affect soil loss within the analysis area. Cumulative effects to soil loss from other bank stabilization and fish passage projects proposed within the analysis area are not likely to affect soil loss within the project area, because those activities would only have a localized affect on soil loss.

#### ***Proposed Action***

**Direct and Indirect Effects:** Potential loss of soil during construction would be minor because mitigation measures described in the Description of the Alternatives, and Best Management Practices would be employed to protect soil and water resources. The primary practices to protect soil and water resources include diverting water around the work area, pumping water that subsurfaces into the work area onto vegetated floodplain, employing Sedimats below the work area, and vegetating, seeding, and mulching the newly sloped bank and other disturbed areas. The express purpose of the proposed bank treatment is to directly reduce soil loss due to bank erosion within the project area. This would be accomplished by laying back and vegetating the bank, and installing boulder vanes to direct flow energy vectors away from the bank and into the center of the channel. The boulder vanes would help direct the energy of flowing water into maintaining vertical pool depth rather than lateral bank erosion.

**Cumulative Effects:** As mentioned above, cumulative effects from livestock grazing would not occur under either alternative. Cumulative effects to soil loss from other bank stabilization and fish passage projects would be enhanced under the Proposed Action, because the localized effect of soil loss would also be reduced in the project area, as well as the other treatment polygons on private land.

## **Porosity**

### ***No Action Alternative***

Because of the high loam and low clay contents of the soil, soil porosity is not easily diminished in the project area or analysis area. Soil porosity is likely to remain the same under this alternative. Cumulatively, neither grazing nor irrigation would not affect soil porosity since these activities do not occur within the project area. Other bank stabilization and fish passage projects could affect soil porosity within the analysis area, by expanding the effects discussed below under the Proposed Action. However, compaction is a localized effect, and compaction from activities in other areas would not affect compaction in the project area.

### ***Proposed Action***

**Direct and Indirect Effects:** The Proposed Action would use heavy equipment to move soil to lay back the bank and re-contour the gravel bar. There is a potential for heavy equipment to directly impact soil porosity by increasing compaction. However, heavy equipment with tracks would be used, which have less weight per square inch than wheeled vehicles, thereby minimizing the potential for compaction. Also, construction would occur during the dry time of year, when soils are drier, and less susceptible to compaction. Irrigation would not increase moisture, because the project area is not grazed nor irrigated. Soil compaction is mostly a concern at moderate moisture levels. The dry nature of the soils in late summer or early fall, when the project area would be constructed, would not lead to compaction due to heavy equipment. Heavy equipment travel on the terraced floodplain would be minimized in order to minimize compaction. Neither bank sloping nor gravel bar re-contouring would affect soil porosity in the long term, as the soil structures would likely remain the same.

**Cumulative Effects:** Grazing and irrigation are not likely to cumulatively impact porosity, since they do not occur in the project area. They may, however, impact porosity in the analysis area. The high loam content of the soils, and extent of good herbaceous cover in the analysis area, however, indicates that compaction is likely minimal. Other bank stabilization and fish passage structure proposals have the potential to expand direct compaction effects, due to construction; however, these effects are expected to be minimal due to timing of construction, and the distribution of weight on tracked equipment, as just discussed under Direct and Indirect Effects.

## **Organic Matter and Nutrients**

### ***No Action Alternative***

Under this alternative, no bank stabilization would occur. Soil nutrients and organic matter are localized soil properties. Existing nutrient levels and organic matter in the



project area would remain. Cumulative effects from agriculture would not affect nutrients and organic matter in the project area, since there is no grazing in the project area. The existing grazing management in the analysis area may cumulatively benefit organic matter and nutrients, by adding manure and nitrogen, and keeping the grasses trimmed. This effect would remain the same under either alternative. Cumulative effects from other bank stabilization and fish passage projects would not affect nutrients and organic matter in the project area.

### ***Proposed Action***

**Direct and Indirect Effects:** Under the Proposed Action, organic matter and soil nutrients may be temporarily decreased during construction. However, project activities would be controlled by Best Management Practices (BMPs), and soil disturbance outside of the sloped bank and gravel bar would be minimal. All disturbed areas would be seeded with native seed and mulched with weed-free mulch after construction. The mulch would replenish organic matter that could be lost due to construction. Project BMPs also require that equipment access routes and staging areas not be mechanically cleared in order to retain the majority of organic matter and nutrients in place. Topsoil on the top of the bank to be sloped would be removed, stock-piled, and spread on the sloped bank in order to retain organic matter and nutrients.

**Cumulative Effects:** There would be no cumulative effects from agriculture are the same as described above under the No Action alternative. Cumulative effects from proposed bank stabilization and fish passage projects would expand the effects discussed above under Direct and Indirect Effects to 21 acres within the analysis area. These effects would remain within each treatment area, and would be minimized using the Best Management Practices discussed above under Direct and Indirect Effects. The Proposed Action would not affect organic matter and nutrients in these other areas, nor would work in those areas affect organic matter and nutrients in the project area.

### **Buffering Capacity**

**Direct, Indirect, and Cumulative Effects for Both Alternatives:** No materials would be added to the soil under either alternative that would alter the reaction class, buffering or exchange capacity. There would be no change in the trend of buffering capacity from existing conditions under either alternative.

## RANGE

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The project area is located within a small (one acre) portion of an isolated 80 acre National Forest System parcel surrounded by private land in American Valley. 99% of the analysis area is private land, with agricultural grazing and haying as the primary land use, with some low-density residential development. The Reid/PNF Treatment Unit project area is currently, and will remain, excluded from grazing by a riparian area corridor fence, which is maintained by the private landowner. Thus, neither range resources, nor management, would be affected by either alternative.

## CULTURAL RESOURCES

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### Affected Environment

A records search (Northeast Information Center in Chico, Mt Hough District Office, and Plumas County Museum) and systematic archeological surface field surveys were completed on all six polygons of the Integrated Greenhorn Creek Restoration Project, including the Reid/PNF Treatment Unit, as well as the five other polygons on private land, including access routes. No cultural resources were found within the Reid/PNF Treatment Unit. Native American consultation was provided by the Native American Heritage Commission, and the Greenville Rancheria of Maidu Indians.

One actively-used 52-year old irrigation dam structure was identified during the records search and field survey, located in one of the private land polygons. An evaluation of significance was completed on the structure. Proposed project activities would not affect the structure.

### Environmental Effects

#### ***No Action and Proposed Action Alternatives***

Because there are no cultural resources within the Reid/PNF Treatment Unit project area, there will be no effect to cultural resources under either alternative. In the event that any previously unrecorded heritage resources are discovered during project implementation, all project related activities in close proximity to the resource(s) must cease. Mt. Hough heritage resource staff shall be immediately notified and the procedures set forth in 36 CFR 800.13 of the Council's regulations will be initiated. ( **36 CFR PART 800 -- PROTECTION OF HISTORIC PROPERTIES (incorporating amendments effective August 5, 2004)**).

## CONSULTATION AND COORDINATION

The following entities were consulted regarding the Proposed Project:

### FEDERAL, STATE AND LOCAL AGENCIES

- California Department of Fish and Game
- California Department of Water Resources
- Regional Water Quality Control Board

- Lori Simpson and Robert Meacher, Plumas County Board of Supervisors
- Plumas County Planning Department
- Sierraville District Ranger

### **TRIBES:**

- Greenville Rancheria
- Susanville Indian Rancheria
- Estom Yumeka Tribe of Enterprise Rancheria
- Tyme Maidu Tribe of Berry Creek Rancheria
- Concow Maidu Tribe of Mooretown Rancheria
- Mechoopda Indian Tribe of Chico Rancheria

### **OTHERS:**

- Participating landowners: Bob & Dorothy Farnworth, Arthur Scoppwer, Victoria Shea, Russell Reid, Lois Jones, Chandler Hills Country Club, Allan Hansen, Lane & Lisa Labbe
- Landowners along Greenhorn Creek and the meadow: Lynn & Lou Etta Held, Michael & Cindy Manitt, William and Michelle Abramson, Brian and Mary Ellen Gage Trustee, Rowland & Eileen Hand, Kenneth & Kathe Roper, William Coates, Holly George, Linda Jordan, Richard and Joanne Sargent, Gary McGowan, Alan & Linda DeWolf, Richard & Susan Clift, Donald & Laura Miller, Jeffrey Hurst, Adolph & Penny Lambach, Bradford & Cynthia Baker, Robert & Judith Neideffer, Lawrence & Susan Holmes, Carl Cuddihy & Donna Forsythe, Albano Bresciani Trustee, Pamela Weis, Johanne Daniels, Nicholas & Dorothy Maximov, William J Perkins, Robert William Porter, David & Nancy Adrian, Cyrus & Susan Miller, Patti Jacoby, Lawrence and Kathy Price, Scott & Patricia Brown, Virginia & James Fleming, Dale & Nina Harris, Rob Russell, Bresciani Family Limited Partnership
- Feather River Land Trust
- Bob Baiocchi
- Trout Unlimited, Feather River Chapter: John Hafen
- Upper Feather River Watershed Group: Carol Dobbas, Russell Reid
- Plumas-Sierra Farm Bureau: Dave Roberti, President
- Plumas-Sierra Cattlemen: Rick Roberti, President,
- Plumas-Sierra Cattlewomen: Pamela Payen, Vice President,
- Sierra Valley Mutual Water District: Chairman Eric Roen, Paul Roen, Al Pombo
- Mill Race Group: Leader Brian Kingdon, Heather Kingdon
- Last Chance Creek Water District: Milt Frei, Doris Goss
- Sierra Valley Groundwater Management District: Carl Genasci, Juliana Walsh

## **Legal Regulatory Compliance and Consultation**

The Mt Hough Ranger District operates under a diverse array of local, state, and federal management guidance and policy as well as various executive orders.

Currently, the Mt Hough Ranger District is guided by the Plumas National Forest 1988 Land and Resource Management Plan (LRMP) as amended by the Herger-Feinstein Quincy Library Group (HFQLG) 1999 Final EIS and Record of Decision (ROD), the 2003 HFQLG Supplemental EIS and ROD and the 2004 Sierra Nevada Forest Plan Amendment (SNFPA) supplemental EIS and ROD.

## **Principle Environmental Laws**

### ***National Environmental Policy Act***

The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) requires that federal agencies rigorously explore and objectively evaluate all reasonable alternatives and briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 Code of Federal Regulations [CFR] 1502.14). The Reid/PNF Treatment Unit EA meets the CEQ regulations requiring public scoping and a thorough analysis of issues, alternatives and effects.

### ***National Forest Management Act***

The National Forest Management Act (NFMA) reorganized, expanded and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on national forest lands. The NFMA Act requires the Secretary of Agriculture to assess forest lands, develop a management plan for each unit of the National Forest System (NFS). The Forest Service is complying with the provisions of this law by designing the project to meet the Standards and Guidelines of the Plumas Forest Plan and its amendments.

### ***Endangered Species Act***

The Endangered Species Act of 1973 (16 USC 1531 et seq.) requires that any action authorized by a federal agency not be likely to jeopardize the continued existence of a threatened or endangered species (TE), or result in the destruction or adverse modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires the responsible federal agency to consult with the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service concerning TE species under their jurisdiction. It is Forest Service policy to analyze impacts to TE to ensure management activities are not be likely to jeopardize the continued existence of a TE, or result in the destruction or adverse modification of habitat of such species that is determined to be critical. This assessment is documented in a Biological Assessment (BA) and is summarized or referenced in Chapter 3.

### ***Wildlife and Fisheries***

Several species identified in the list of T&E species provided by the USFWS ([http://www.fws.gov/sacramento/es/spp\\_lists/NFActionPage.cfm](http://www.fws.gov/sacramento/es/spp_lists/NFActionPage.cfm)), updated April 29, 2010, will not be analyzed further for this project due to the lack of species distribution and/or lack of designated critical habitat. Refer to the Wildlife section of this EA and the Wildlife BA/BE located in the project record at the Mt Hough District office.

### ***Botany***

The latest species list for Plumas County fulfills the requirements to provide a current species list pursuant to Section 7(c) of the Endangered Species Act, as amended.

Controlling special interest plants (noxious weeds/invasive plants) and populations greatly reduces the impact to botanical resources. Occurrences would be protected by flagging and avoiding as a control area, and would be flagged prior to implementation.

Refer to the Botany section of this EA and the Botany BE located in the project record at the Mt Hough District office.

### ***Clean Water Act***

Section 208 of the Clean Water Act required the States to prepare non-point source pollution plans, which were to be certified by the State and approved by the Environmental Protection Agency (EPA). In response to this law and in coordination with the State of California Water Resources Control Board (SWRCB) and EPA, Region Five began developing Best Management Practices (BMPs) for water quality management planning on National Forest System lands within the State of California in 1975. The Reid/PNF Treatment Unit meets the Clean Water Act by implementing the Best Management Practices of the Soil and Water Conservation Handbook. By using BMPs, the Proposed Action meets this Act according to the ROD of the SNFPA (Section VII, ROD of the SNFPA).

### ***Clean Air Act***

The Clean Air Act provides the principal framework for national, state and local efforts to protect air quality. Under the Clean Air Act, the Office of Air Quality Planning and Standards is responsible for setting standards for pollutants which are considered harmful to people and the environment. The 1990 Clean Air Act is the most recent version of a law first passed in 1970.

### ***National Historic Preservation Act***

Section 101 of the National Environmental Policy Act (NEPA) requires the federal government to preserve important historic, cultural and natural aspects of our natural heritage. To accomplish this, federal agencies utilize the Section 106 process of the National Historic Preservation Act (NHPA). This process has been codified in 36 CFR 800 Subpart B. The coordination or linkage between the Section 106 process of the NHPA and the mandate to preserve our national heritage under NEPA is well understood and is formally established in 36 CFR 800.3b and 800.8. NEPA includes reference to "...important historic, cultural and natural aspects of our national heritage". Locally, the Plumas National Forest uses a programmatic agreement (PA) between Region 5 of the US Forest Service, the California State Historic Preservation Officer and the Advisory Council on Historic Preservation to implement the Section 106 process. This Reid/PNF Treatment Unit EA meets NHPA by protecting cultural resources through field survey, tribal and historical preservation society consultation and protection of sites in the project area. No cultural resource sites occur in the project area on National Forest System lands. There is one site on private land in one of the private land polygons, thus the US Army Corps of Engineers has jurisdiction over the implementation of NHPA on that site.

## **Executive Orders**

### ***Consultation and coordination with Indian Tribal governments, Executive Order 13175 of November 6, 2000***

Tribes that were consulted during the NEPA scoping phase of the project are listed in the previous section of this EA regarding Consultation and Coordination. They were sent letters on February 24, 2011.

### ***Indian Sacred Sites, Executive Order 13007 of May 24, 1996***

Through scoping and consulting with local Native American tribes, it was determined that there were no Indian sacred sites in the project area.

### ***Invasive species, Executive 13112 of February 3, 1999***

Executive Order 13112 created the Invasive Species Council (ISC) to order to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological and human health impacts that invasive species cause. Federal agencies are required to:

- Identify actions that may affect the status of invasive species
- Use relevant programs and authorities to prevent the introduction, control and monitoring of invasive species
- Provide for native species restoration as well as their habitats
- Promote public information
- Not condone or carry out actions that may spread invasive species
- Consult with the ISC and other stakeholders as appropriate

The Project meets the Executive Order by following the noxious weed management Standards and Guidelines in Appendix A of the ROD for SNFPA. The SNFPA guidelines direct proactive management of noxious weeds that meet with the Executive Order. The District Botanist carries out the intent of the Executive Order and the noxious weeds Standards and Guides by ensuring that the following are completed by project personnel:

- Identifying and controlling weed infestation areas
- Preventing the spread of noxious weeds through SOPs and site specific mitigations

### ***Floodplain management, Executive Order 11988 of May 24, 1977 and Protection of Wetlands, Executive Order 11990 of May 24, 1977***

Executive Orders 11988 and 11990 require federal agencies to avoid, to the extent possible, short- and long-term effects resulting from the occupancy and modification of flood plains and the modification or destruction of wetlands. These executive orders are intended to preserve the natural and beneficial values served by floodplains and wetlands. The Project meets these executive orders by implementing the Best Management Practices (BMP) of the Soil and Water Conservation Handbook. By using BMPs, the Project meets the executive orders according to the ROD of the SNFPA (Section VII, ROD of the SNFPA).

### ***Environmental Justice, Executive Order 12898 of February 11, 1994***

Executive Order 12898 requires that Federal agencies make achieving environmental justice part of their mission by identifying and addressing, as appropriate,

disproportionately high and adverse human health and environmental effects of their programs, policies and activities on minority and low-income populations. No low-income or minority populations are within the vicinity of the Project, and activities associated with the Project would not discriminate against these populations. Proposed activities would not adversely affect community, social, economic and health and safety factors. Public scoping was conducted in accordance with NEPA regulations to identify any potential issues or hazards associated with the Project.

***Use of off-road vehicles, Executive Order 11644 and 11989, amended May 25, 1977***

It is the purpose of these orders to establish policies and provide for procedures that will ensure that the use of off-highway vehicles (OHV) on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands and to minimize conflicts among the various uses of those lands. On July 15, 2004, the Forest Service published proposed travel management regulations in the Federal Register. The final rule provides a national framework for local units to use in designating a sustainable system of roads, trails and areas for motor vehicle use. The rule's goal is to secure a wide range of recreation opportunities while ensuring the best possible care of the land. Currently, no roads are being proposed for decommissioning in association with the Project.

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## APPENDIX A

### BEST MANAGEMENT PRACTICES APPLICABLE TO THIS ASSESSMENT

Land management activities have been recognized as potential sources of nonpoint source water pollution. By definition, nonpoint source pollution is not controllable through conventional treatment plant means. Containing the pollutant at its source, thereby precluding delivery to surface water, controls nonpoint source pollution. Sections 208 and 319 of the Federal Clean Water Act, as amended, acknowledge land treatment measures as being an effective means of controlling nonpoint sources of water pollution, and emphasize their development.

Working cooperatively with the California State Water Quality Board, the Forest Service has developed and documented nonpoint source pollution control measures applicable to National Forest System Lands. Following evaluations of the control measures by State Water Quality Board personnel as they were applied on site during management activities, an assessment of monitoring data, and the completion of public workshops and hearings, the Forest Service's measures were certified by the State and approved by the Environmental Protection Agency as the most effective means the Forest Service could implement to control nonpoint source pollution. These measures were termed "Best Management Practices" (BMPs). Best Management Practice control measures are designed to accommodate site-specific conditions. They are tailor made to account for the complexity and physical and biological variability of the natural environment. In the 1981 Management Agency Agreement between the State Water Resources Control Board and the Forest Service, the State agreed that; "The practices and procedures set forth in the Forest Service document constitute sound water quality protection and improvement on National Forest System lands". The implementation of BMPs is the performance standard against which the success of the Forest Service's nonpoint source pollution water quality management efforts are judged.

Forest BMPs are found in *Water Quality Management for Forest System Lands in California* (USDA, 2000). Below is a listing of the BMPs that would primarily guide this project.

**2.12. Servicing and Refueling Construction Equipment:** Prevents pollutants such as fuels, lubricants, bitumens, sewage, wash water and other harmful materials from being discharged into or near rivers, streams and impoundments or into natural or man-made channels leading to these features.

**2.13. Control of Construction in Streamside Management Zones:** Designates a zone along streams, which would reduce the adverse effects of nearby roads, by acting as an effective filter for sediment generated by erosion from road fills, dust drift and oil traces; maintain shade, riparian habitat and channel stabilizing effects;

and maintain the floodplain surface in a resistant, undisturbed condition to limit erosion by flood flows.

**2.14 Controlling In-Channel Excavation:** Minimizes stream channel disturbances and related sediment production.

**2.15 Diversion of Flows Around Construction Sites:** Insures that all stream diversions are carefully planned, to minimize downstream sedimentation originating from working in or near the channel and to restore stream channels to their natural grade, condition and alignment as soon as possible.

**2.20. Specifying Riprap Composition:** Minimizes sediment production associated with the installation and utilization of riprap material.

**4.4. Documentation of Water Quality Data:** Assures the availability of water quality data and related information when making analysis and interpretations with respect to water quality management.

**7.1 Watershed Restoration:** Improves water quality and soil stability.

**7.6. Water Quality Monitoring:** Encourages the collection of representative water samples to determine base line conditions for comparison to established water quality standards which are related to beneficial uses for that particular watershed.

## APPENDIX B –

### PROJECT MONITORING

The following parameters would be monitored to measure the success of the project, and to determine whether or not the project met the Purpose and Need. Plumas Corporation would be responsible for carrying out the monitoring.

Table B-1. Project Monitoring Plan.

Parameter	Protocol	Frequency	Target
Sedimentation	SCI grid toss protocol	Once pre-project July 2011, once post-project July 2012	50% reduction in pooltail fines within project area
Summer water temperature	Continuous recording thermographs May-Sept	Twice pre-project 2009, 2010 at mouth; once pre-project at 4 locations along the channel in the analysis area in 2011; twice post-project at same locations	Three degree Farenheit decrease in water temperature at the mouth of Greenhorn creek in three years.
Bank stability	SCI bank stability protocol	Once pre-project July 2011; once post-project July 2012	100% increase in bank stability
Fish populations	Electroshock sampling	Once pre-project at mouth of Greenhorn Creek. Once post-project in 5 years (not yet funded), in conjunction with SCI surveys.	Increase in trout biomass
Noxious weeds	Visual within entire project area June-July for 3 years; and weed treatment	June & July from 2011-2014	No noxious weeds in project area in 3 years



# INTEGRATED GREENHORN CREEK RESTORATION PROJECT

## Biological Evaluation

### For Threatened, Endangered or Sensitive Plant Species

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**Date:** September13, 2010

#### Summary:

No occurrences of species of concern were previously known from within the Proposed Project area (see Botanical Prefield Review Information dated June 5, 2010). No Sensitive, Federal or State listed plant species of concern were found within the Proposed Project area (see Botanical Field Reconnaissance Report dated June 30, 2010).

The effects determination in this document concludes that:

1. There would be no effect to Threatened, Endangered, or Proposed plant species.
2. The “no action” alternative would not affect Federal or State listed species.
3. The action alternative will not affect individuals and will not cause a trend toward federal listing or loss of viability to Forest Service sensitive plant species.

## **I. INTRODUCTION**

### **PURPOSE:**

The purpose of this Biological Evaluation (BE) is to describe the effects of the Proposed Project on all threatened, endangered and sensitive (TES) plant species of record for the project area. The objectives of the BE are:

1. To ensure that Project actions do not contribute to loss of viability of any native or desired non-native plant species.
2. To ensure that Project actions do not hasten the federal listing of any species.
3. To provide a process and standard through which TES species receive full consideration throughout the planning process, reducing negative impacts to species and enhancing opportunities for mitigation.

### **PROJECT NAME, TYPE AND LOCATION:**

**Name:** Integrated Greenhorn Creek Restoration Project

**Type:** This is a stream restoration project. See Section IV: "Description of Project".

**Location:** From Quincy, CA, take Quincy Junction Road off Highway 70/89 from the middle of town about 2 miles to the junction of Chandler Road. The Proposed Project locations are all in the general vicinity (see attached maps).

### **FIELD RECONNAISSANCE:**

**Date(s) of field work:** June 11-16, 2010

**By:** Jim Battagin, Butterfly Botanical Consultants

**Number of acres surveyed:** Approx. 34 acres.

**The area indicated on the attached map was surveyed for the following species of concern as determined by the Botanical Prefield Review Information (see Botanical Prefield Review Information dated 6-5-10):**

*Carex sheldonii*, *Cypripedium montanum*, *Lupinus dalesae*, *Orcuttia tenuis* and *Pseudostellaria sierrae*.

Further, a plant species list was assembled (see "Plant Species List and Information – Integrated Greenhorn Creek Restoration Project" dated June 20, 2010). This ensures

that any species not listed in the Botanical Prefield Review Information or any initially unknown plants are identified and considered.

**The following type of reconnaissance(s) was conducted in the project area:**

**Cursory:**\_\_\_\_ **General:**\_\_\_\_ **Complete:**  X  **Intuitive controlled:**  X

**The reconnaissance was conducted in the following manner:** The entire project area was viewed from various distances (intuitive survey). Areas that were thought to be potential habitat for target species were viewed more closely (complete survey) at a phenologically appropriate time.

**Species located:** None.

**Unoccupied habitat located (how much, where, description):** Potential habitat may exist within the Proposed Project area for:

*Carex sheldonii*, a Category 2 Special Interest Species.

However, no unoccupied potential habitat was positively identified.

## **II. CONSULTATION TO DATE:**

No formal or informal consultation with the USFWS has been conducted since no threatened, endangered or candidate species were found in the Proposed Project area. The latest USFWS species list for Plumas County/Plumas National Forest was accessed from the USFWS website. This list fulfills the requirements to provide a current species list pursuant to Section 7(c) of the Endangered Species Act, as amended. The United States Fish and Wildlife Service (USFWS) list of federally listed threatened and endangered plant species potentially occurring in the Plumas National Forest includes one threatened plant species, *Orcuttia tenuis* (slender Orcutt grass). *Orcuttia tenuis* is limited to relatively deep vernal pools or vernal pool type habitat with clay soil. No vernal pools were found during field surveys and none are known to occur in the Proposed Project area. Therefore, no threatened or endangered species are considered likely to occur in the Proposed Project area. Consequently, threatened and endangered species will not be discussed in the affected species section of this biological evaluation.

## **III. CURRENT MANAGEMENT DIRECTION:**

### **Rare Plant Management:**

No federal or state listed species were found and therefore no management is required by law. Further, no USFS sensitive species were found.

### **Noxious Weed Management:**

See “NOXIOUS WEEDS” under Section VIII; Management Recommendations.

*Also see Appendix G: “Integrated Greenhorn Creek Restoration Project, Noxious Weed Risk Assessment” dated 9-10-10 for a complete analysis and recommendations for noxious weeds.*

## **IV. DESCRIPTION OF PROJECT:**

Greenhorn Creek is the primary water course through American Valley, and has been used as an important resource for both Euro-American settlers and Native Americans before them. Through recent history, existing uses and property boundaries have taken a toll on the ability of the system to ecologically absorb perturbations. The proposed treatments consider existing land uses, constraints, and channel dynamics, including bedload movement through the Greenhorn Creek system. The two fish passage structures, at the Shea Dam and Reid Dam at Highway 70 (treatments 2 and 5, listed below) would protect the dams from further erosion damage, and stabilize the channel bed and banks. Implementation at any of the treatment sites is not dependent upon implementation at any other site. However, all treatments are being analyzed under one environmental document as an integrated restoration approach across multiple jurisdictional boundaries. The following lists all Greenhorn Integrated Restoration Project treatments considered under this analysis:

1. Above and below Quincy Junction Road, boulder vanes would be installed on 1,800 feet of actively eroding banks for stabilization. Banks would be sloped and vegetated. Access into the APE would be from the Quincy Junction Road onto an existing ranch access route.
2. At the Shea Dam, 3,000 cubic yards of 4’-minus pit material would be used to create a 350’-long, fish passable riffle-pool structure. Bank stabilization using rock, vegetation, and/or sloping along 1,466 feet up and downstream of the dam. Access into the APE would be from the existing gravel driveway, which was constructed of imported fill.
3. At the Carol Lane East Bridge, boulder vanes would be installed along a 540 feet section of channel to stabilize the channel bed and bank. Access into the APE would be on the existing paved road.
4. At the Plumas National Forest/Reid bank, boulder vanes would be installed, and banks sloped and vegetated along a 390-foot section of actively eroding bank. Access into the APE from the paved road would be on the existing dirt ranch road, which was surveyed.
5. At the Highway 70 irrigation dam (Reid Dam), 5,000 cubic yards of material would be used to install a 450’-long fish-passable riffle pool structure. Banks would be sloped and vegetated. Access from the highway would be on an existing dirt ranch road in the APE, which was surveyed.

6. On the Farnworth property, boulder vanes would be installed along a 220 foot section of actively eroding bank. Banks would be sloped and vegetated. Access from the highway would be on an existing dirt ranch road in the APE, which was surveyed. Project equipment will include an excavator, a front end loader, and two dump trucks, which will access the project on existing paved roads, one gravel driveway, and three dirt roads.

## V. EXISTING ENVIRONMENT:

No known previous surveys have been conducted within the Proposed Project area in the past.

However, the following species of concern have been previously found within the general vicinity of the Proposed Project area (see Botanical Prefield Review Information dated June 5, 2010) and may have potential habitat within the area:

<u>Species</u>	<u>Rating*</u>
<i>Lupinus dalesae</i>	Sensitive
<i>Pseudostellaria sierrae</i>	Special Interest, Category 2

Other species of concern with potential to be within the Proposed Project area are:

<u>Species</u>	<u>Rating*</u>
<i>Carex sheldonii</i>	Report occurrences (Category 2)
<i>Cypripedium montanum</i>	Sensitive

\* The above ratings are all USFS categories.

For information on the life histories of these species (i.e. distribution, habitat, elevation, key features, look-alikes and flowering times) see Rare Plant Handbook, USFS, Plumas National Forest, August 1999.

## VI. EFFECTS OF THE PROPOSED PROJECT:

An effects analysis is a part of the biological evaluation process that is required in cases where sensitive plants have been found within or near proposed project areas. Effects are described as direct, indirect, and/or cumulative. The following summarizes the direct, indirect, and cumulative effects of the project on the sensitive-status plant species listed in the introduction.

### **A. General Discussion of Direct, Indirect, and Cumulative Effects**

**Direct Effects:** Direct effects occur when sensitive plants are physically impacted by activities associated with the proposed action. Direct impacts can physically break, crush or uproot sensitive plants by driving over them, by covering them, by falling trees on them, or by seeding directly on top of them. Direct impacts to sensitive plants can physically damage the sensitive plant or the habitats where they grow. When too much of an individual plant is damaged, that plant may experience altered growth and development, and reduced or eliminated seed-set and reproduction. If the disturbance is severe, it can kill sensitive plants. These impacts to individual plants can reduce the growth and development, population size, and potentially the viability of a sensitive plant species across the landscape. For annual plant species, the timing of impacts is critical. Management actions which take place after annuals have set seed have much less impact than management actions performed prior to seed-set. Direct effects being considered in this discussion include re-sloping of stream channels and banks, construction of boulder vanes, vegetating the upper bank with native seed, and relocating gravel bars onto constructed floodplain banks.

**Indirect Effects:** The proposed action for bank stabilization treatments can indirectly impact sensitive plants by causing changes in vegetation composition and successional pathways of that vegetation, changing local hydrologic patterns in sensitive plant habitat, or by changing the soil characteristics of the habitat. Some of these changes may result from shifts in hydrologic, solar, and soil characteristics of their habitat. Management actions can also lead to changes in forage condition, and this can lead to changes in the foraging behavior of livestock and wildlife within the analysis area. New use patterns can result in different potential impacts to sensitive species. Indirect effects can also occur from noxious weed invasion or from impacts to pollinators or mycorrhizae associated with sensitive plant species. Indirect impacts can have positive or negative effects.

Some indirect effects, such as noxious weed invasion, potentially pose a highly negative impact to all plant habitats, although different habitats may be invaded by different species of noxious weeds. In riparian areas or wet meadows, Canada thistle (*Cirsium arvense*) and perennial pepperweed (*Lepidium latifolium*) may invade with potentially catastrophic results. Upland areas may be invaded by a host of noxious weeds such as yellow star thistle (*Centaurea solstitialis*), the knapweeds (*Centaurea* spp.), or annual grasses such as medusahead (*Taeniatherum caput-medusae*). These noxious weeds can lead to habitat changes that are detrimental to sensitive plant species. Noxious weeds, once established, could indirectly impact sensitive plant species through allelopathy (the production and release of plant compounds that inhibit the growth of other plants), changing the fire regime, or direct competition for nutrients, light, or water. Subsequent weed control efforts such as hand-pulling, hoeing, mowing, or herbicide application could also negatively impact sensitive plants.

**Cumulative Effects:** Past and current activities can alter sensitive plant occurrences and their habitats. Current management direction is designed to eliminate or reduce

possible negative cumulative impacts by protecting sensitive plant species from direct and indirect impacts. The following discussion provides an explanation of why this type of management is effective in reducing cumulative impacts.

MacDonald (2000) reports that a critical step in cumulative effects analysis is to compare the current condition of the resource (in this case sensitive plants) and the projected changes due to management activities (bank stabilization using heavy equipment) with the natural variability in the resources and processes of concern. This is difficult for sensitive plants since long-term data are often lacking, and many sensitive plant habitats have a long history of disturbance, i.e. an undisturbed reference is often lacking. For some species, particularly those that do not tolerate disturbance or are found under dense canopy conditions, minimizing on-site changes to sensitive plants is an effective way of reducing cumulative impacts. "If the largest effect of a given action is local and immediate, then these are the spatial and temporal scales at which the effect would be easiest to detect. If one can minimize the adverse effects at this local scale, it follows that there would be a greatly reduced potential for larger-scale effects" (MacDonald, 2000). For other species, particularly those that are disturbance tolerators or fire-followers, minimizing on-site changes could be detrimental. These species tolerate or benefit from on-site changes that result in opening the stand, reducing the potential for catastrophic fire, and increasing light reception in the understory. Thus, the response of sensitive plant species to the management activities is species-dependent.

If adverse effects are not minimized at the local level, cumulative effects will occur. Past and present forest management activities have caused changes in plant community structure and composition across the national forests. A few management activities that have cumulatively impacted sensitive plant occurrences on the Plumas National Forest include: historic grazing, timber harvest, fire suppression, prescribed fire, mining, recreational use, road construction, urban development, and noxious weed infestation. These cumulative impacts have altered the present landscape to various degrees. However, cumulative, direct and indirect effects can be minimized by following Forest Service standards and guidelines and by implementing mitigation measures to monitor or offset impacts to sensitive plants species. With these protective measures in place, cumulative effects are less likely to be adverse.

#### **A. Alternative 1: The Proposed Action: Direct, Indirect, and Cumulative Effects**

*Carex sheldonii*, may have potential habitat in the project area but was not found during botanical surveys. The potential habitat of this species may be treated under the proposed action since no occurrences were found. Although adequate botanical surveys have been performed in the project area, it is possible that isolated individuals may have been overlooked. Therefore, undiscovered individuals may be impacted inadvertently. For this reason (potential impact to undiscovered individuals) a determination of "may impact individuals but not likely to cause a trend toward federal listing or loss of viability" has been made for this species. However, if *Carex sheldonii* is discovered during project implementation, it is recommended that it be flagged and avoided if

feasible.

Note: *Carex sheldonii* is not protected by law or regulation on private lands and, although protection is recommended when feasible, it is not required.

#### Direct Effects

Stream channel rehabilitation and bank stabilization via mechanical treatment could cause detrimental effects to any sensitive species found in the project area. Using heavy machinery to perform restoration activities has the potential to directly impact sensitive plants by crushing plants, displacing soil and plants, or smothering plants with soil. Direct effects are unlikely since no sensitive plants were found. However, any undiscovered sensitive plants could be affected.

#### Indirect Effects:

Noxious weeds can be brought into the Project area in road materials and mulch. Once established, noxious weeds can be difficult to control and eliminate from an area. Noxious weeds displace native plant habitat and degrade watershed functions. If the standard management requirements such as inventory, avoiding noxious weed areas with watershed restoration activities when possible, cleaning equipment, using weed free material and mulch are utilized, the spread of noxious weeds can be greatly reduced.

Although there are many parts of the Project area that are already infected by noxious weeds, the standard management practices can help to prevent the introduction and spread of noxious weeds. It is not realistic to expect Project activities to actually reduce the size of already infected areas. (See supporting document in Appendix G; “Integrated Greenhorn Creek Restoration Project, Noxious Weed Risk Assessment”).

#### Cumulative Effects:

Standard management practices required in the action alternative will minimize potential adverse direct effects to sensitive plant species (avoidance, deferred grazing, and noxious weed mitigations). Minimizing direct effects is the largest individual factor in diminishing cumulative effects to sensitive plant species.

Noxious weeds will continue to pose a threat to native plant habitat and sensitive plant species. With the mechanical treatments of the proposed action, noxious weeds can more easily invade the area. Cumulatively, if this disturbance is applied on a landscape level without standard management requirements, noxious weeds could easily become further established.

The cumulative effects from the proposed action are an extension of the direct and indirect effects especially if these effects are not mitigated. Known foreseeable future actions within or adjacent to the current project area include the continuation of grazing



on the property. Grazing can result in the degradation of sensitive species populations through trampling, loss of proper hydrologic function by streamside trampling, and the loss of reproduction for the season by browsing buds and flowers before they go to seed. Standards and guidelines apply to all foreseeable future actions and will reduce cumulative effects on sensitive plant species.

The extent of cumulative effects depends on the management of potential direct and indirect effects, as well as the attributes of the sensitive plant species located within the analysis area, their distribution within the analysis area, and the ability to design future projects with sensitive plant attributes in mind. Overall, management of the direct and indirect effects through project design and mitigation measures is assured to minimize the potential for cumulative effects. Adverse cumulative effects are not expected as a result of implementation of the Integrated Greenhorn Creek Restoration Project for the following reasons:

- The project area has been adequately surveyed for plant species of concern.
- no known occurrences of any species of concern were found.
- any species of concern that are discovered during Project activities will be flagged and avoided if possible while still carrying out the intent of the Project.

By reducing potential direct and indirect effects through botanical surveys, project design, and protection of existing sensitive plant populations, cumulative effects are expected to be minimal.

### **C) Alternative 2: No Action Alternative: Direct, Indirect, and Cumulative Effects**

#### **Direct Effects:**

There are expected to be no direct effects from the no-action alternative other than those associated with current ongoing non-project activities.

#### **Indirect Effects:**

Indirect effects from the no action alternative are those associated with continued habitat degradation through widening and downcutting of the stream, ongoing grazing, and the current and future effects of noxious weed infestation. Grazing activities are anticipated to continue in portions of the Proposed Project area and could possibly impact potentially undiscovered sensitive plants although none were discovered in the botanical survey

#### **Cumulative Effects:**

Probably the most important factors contributing to potential cumulative effects of the no action alternative would include those associated with continued degradation of

habitat through stream channel degradation with little effect on plants of concern.

## **VII. DETERMINATION:**

The Effects Determination discussed here is based on professional experience and judgment, existing information (including existing condition of the analysis area), and the potential impacts of the alternatives. An effects determination is also the culmination of the analysis of potential direct, indirect, and cumulative effects. Even if the potential direct effects are low, there is often the potential for the indirect or cumulative effects to affect (to some degree) the viability of the species.

It is my determination that the Integrated Greenhorn Creek Restoration Project:

### **Alternative 2-No action:**

  X   Will not affect: the USFWS threatened and endangered listed species *Orcuttia tenuis*, since no habitat was found in the Proposed Project area, or US Forest Service special interest species of concern: *Carex sheldonii*.

The no-action alternative will cause no significant direct, indirect, or cumulative effects to these species.

### **Alternative 1-Proposed Action:**

  X   Will not affect: *Orcuttia tenuis*. This species will not be impacted during implementation for the following reason: no potential habitat was found in the Proposed Project area.

  X   May impact individuals but not likely to cause a trend toward federal listing or loss of viability to:

*Carex sheldonii*, These species may be impacted during implementation for the following reason: undiscovered occurrences may exist in the project area. The project area has been adequately surveyed for species of concern, and such impacts are expected to minimal to none.

## **VIII. MANAGEMENT RECOMMENDATIONS:**

### **RARE PLANT SPECIES OF CONCERN:**

During the field reconnaissance, no plants of concern were found. In addition, no specific potential habitat for any plants of concern was found except possibly *Carex sheldonii*, a USFS special interest species. However, *Carex sheldonii* has never been found in the American Valley area. Therefore, it is unlikely that any plants of concern or their habitats will be encountered or affected during the implementation of this project. However, if any *Carex sheldonii* is encountered during Project activities, it is

recommended that it be flagged and avoided if possible. Protection is recommended when feasible, but not required by law or regulation.

However, should any plants of concern be discovered during project implementation, it is recommended that they be flagged and avoided if possible without until an analysis of their importance is completed.

#### NOXIOUS WEEDS:

The following noxious weeds were discovered during the Botanical Reconnaissance (see Botanical Field Reconnaissance Report, Integrated Greenhorn Creek Restoration Project, dated 6-30-10):

1. *Centaurea solstitialis* (Yellow Star-thistle):
2. *Cirsium arvense* (Canada Thistle):
3. *Taeniatherum caput-medusae* (Medusahead)

Occurrences of these species are quite widespread in the Proposed Project area and have the potential to spread with Project activities.

*Also see Appendix G: "Integrated Greenhorn Creek Restoration Project, Noxious Weed Risk Assessment" dated 9-10-10 for a complete analysis and recommendations for noxious weeds.*

#### IX. REFERENCES:

California Native Plant Society (2001). Inventory of Rare and Endangered Vascular Plants of California, 6th Edition. Sacramento.

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The Jepson Desert Manual. Margriet Wetherwax, Managing Editor. 2002.

The Jepson Manual, Higher Plants of California, James C. Hickman, Editor, 1993.

## **X. CONTRIBUTORS:**

Jim Belshier-howe, Botanist, Mt. Hough Ranger District. Document assistance.

Michelle Coppoletta, Assistant Botanist, Mt. Hough Ranger District. May 2010.

## **XI. APPENDICES:**

**Appendix A:** Integrated Greenhorn Creek Restoration Project General Location Map.

**Appendix B:** Integrated Greenhorn Creek Restoration Project Botanical Survey Map.

**Appendix C1 through C5:** Integrated Greenhorn Creek Restoration Project Noxious Weed Location Maps.

**Appendix D:** Botanical Prefield Review Information for the Integrated Greenhorn Creek Restoration Project. Compiled by Jim Battagin, June 5, 2010.

**Appendix E:** Botanical Field Reconnaissance Report for the Integrated Greenhorn Creek Restoration Project. Compiled by Jim Battagin, June 30, 2010.

**Appendix F:** Plant Species List and Information for the Integrated Greenhorn Creek Restoration Project Compiled by Jim Battagin, dated June 20, 2010.

**Appendix G:** Noxious Weed Risk Assessment for the Integrated Greenhorn Creek Restoration Project. Compiled by Jim Battagin, dated September 10, 2010.



## Appendix A

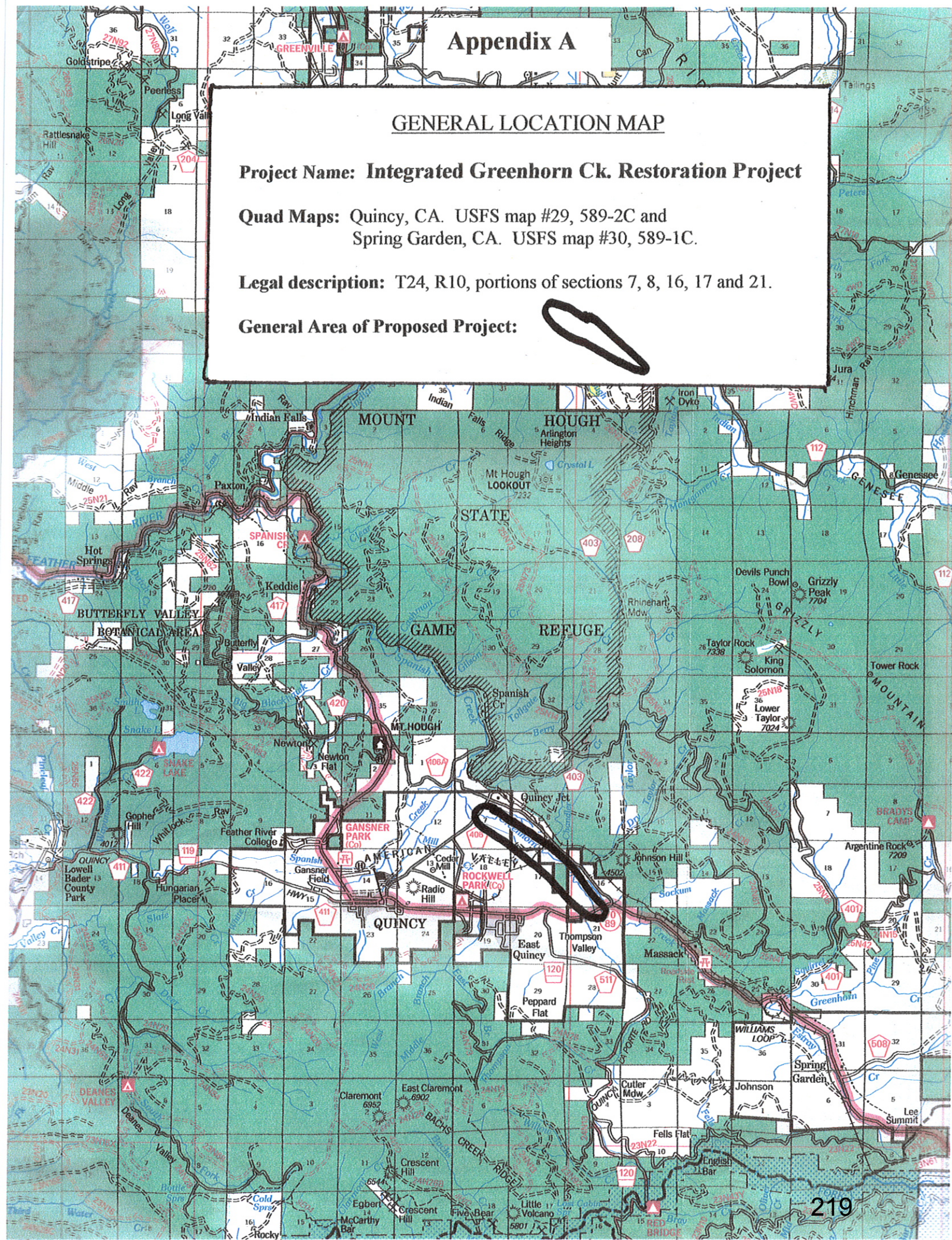
### GENERAL LOCATION MAP

**Project Name:** Integrated Greenhorn Ck. Restoration Project

**Quad Maps:** Quincy, CA. USFS map #29, 589-2C and  
Spring Garden, CA. USFS map #30, 589-1C.

**Legal description:** T24, R10, portions of sections 7, 8, 16, 17 and 21.

**General Area of Proposed Project:**





# Greenhorn Creek Res Project Locations T24N R10E S21, 16, 1

## BOTANICAL SURVEY LOCATION MAP

Project Name: **Integrated Greenhorn Ck. Restoration Project**

Quad Maps: Quincy, CA. USFS map #29, 589-2C and

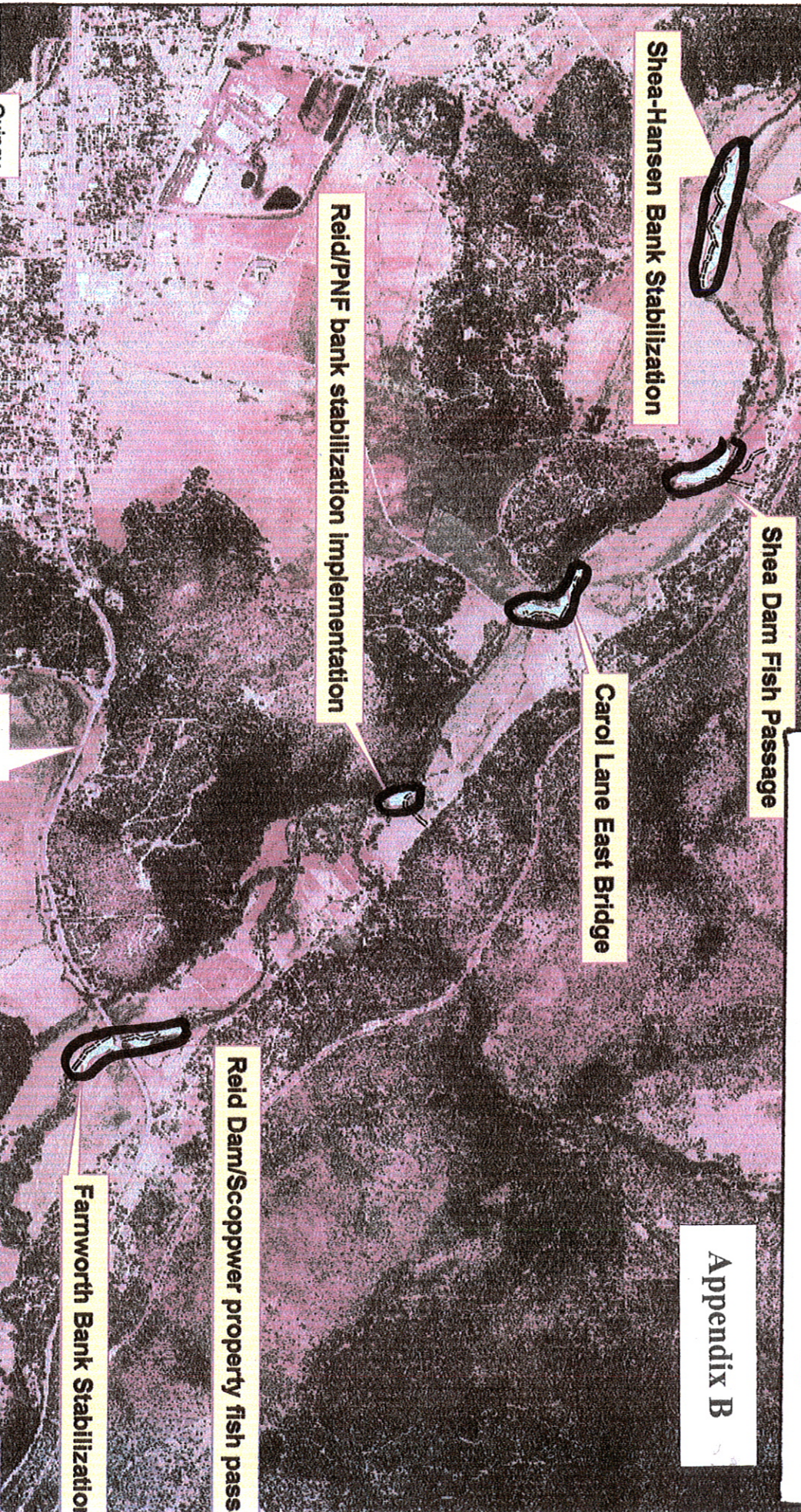
Spring Garden, CA. USFS map #30, 589-1C.

Legal description: T24, R10, portions of sections 7, 8, 16, 17 and 21.

Project and Botanical Survey Area Boundaries:



## Appendix B





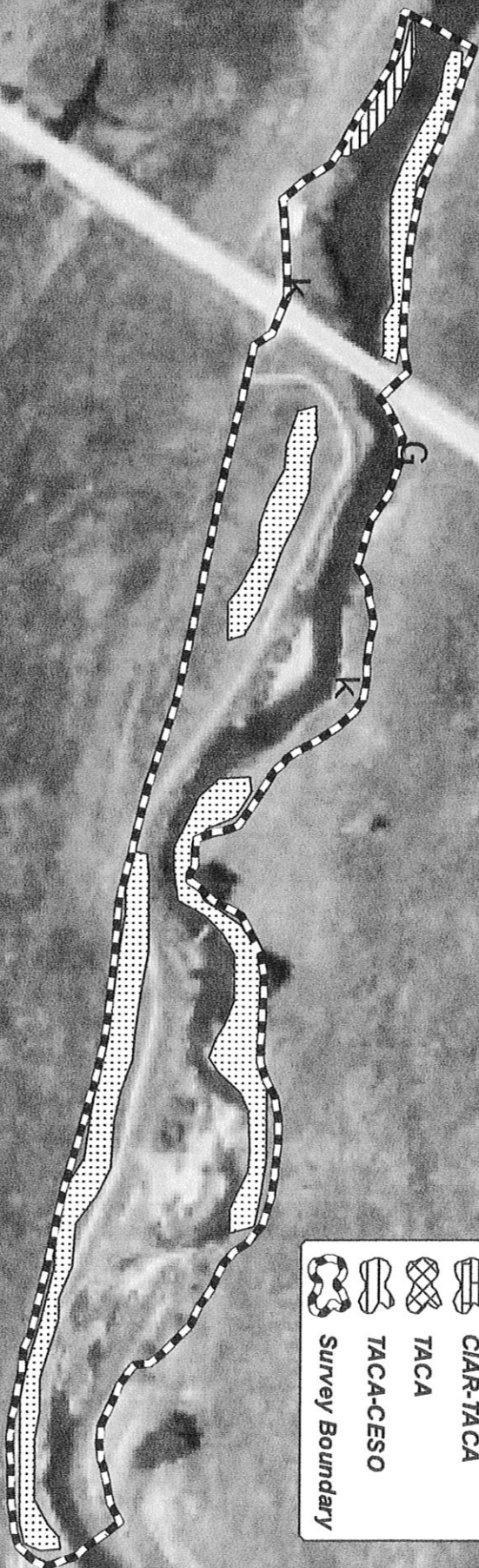
KEY TO NOXIOUS WEED  
SPECIES CODES  
For Integrated Greenhorn Creek  
Restoration Project

CADR = *Cardaria draba* (Hoary Cress)  
CESO = *Centauraea solstitialis* (Yellow Star-thistle)  
CIAR = *Cirsium arvense* (Canada Thistle)  
TACA = *Taenidherum caput-medusae* (Medusahed)

Appendix C1

Legend

I	CADR
#	CESO
"	CIAR
K	TACA
G	TACA-CIAR
Occurrences	
	CESO
	CIAR
	CIAR-TACA
	TACA
	TACA-CESO
	Survey Boundary



0 62.5 125 250 375 500  
Feet  
Scale 1:2,500

Greenhorn Creek Restoration  
Shea-Hansen 1

James Battaglin  
Butterfly Botanical Consultants

Compiled By D.M. Churchill  
8/2/2010

# Legend

- I CADR
- # CESO
- " CIAR
- K TACA
- G TACA-CIAR
- Occurrences
- CEISO
- CIAR
- CIAR-TACA
- TACA
- TACA-CEISO
- Survey Boundary

## Appendix C2

### KEY TO NOXIOUS WEED SPECIES CODES

#### For Integrated Greenhorn Creek Restoration Project

- CADR = *Cardaria draba* (Hoary Cress)
- CEISO = *Centaurea solstitialis* (Yellow Star-thistle)
- CIAR = *Cirsium arvense* (Canada Thistle)
- TACA = *Taeniatherum caput-medusae* (Medusahed)



0 37.5 75 150 225 300 Feet  
Scale 1:3,500

Greenhorn Creek Restoration  
Shea-Hansen 2

James Battogin  
Butterfly Botanical Consultants

Compiled By D.M. Churani  
8/2/2010



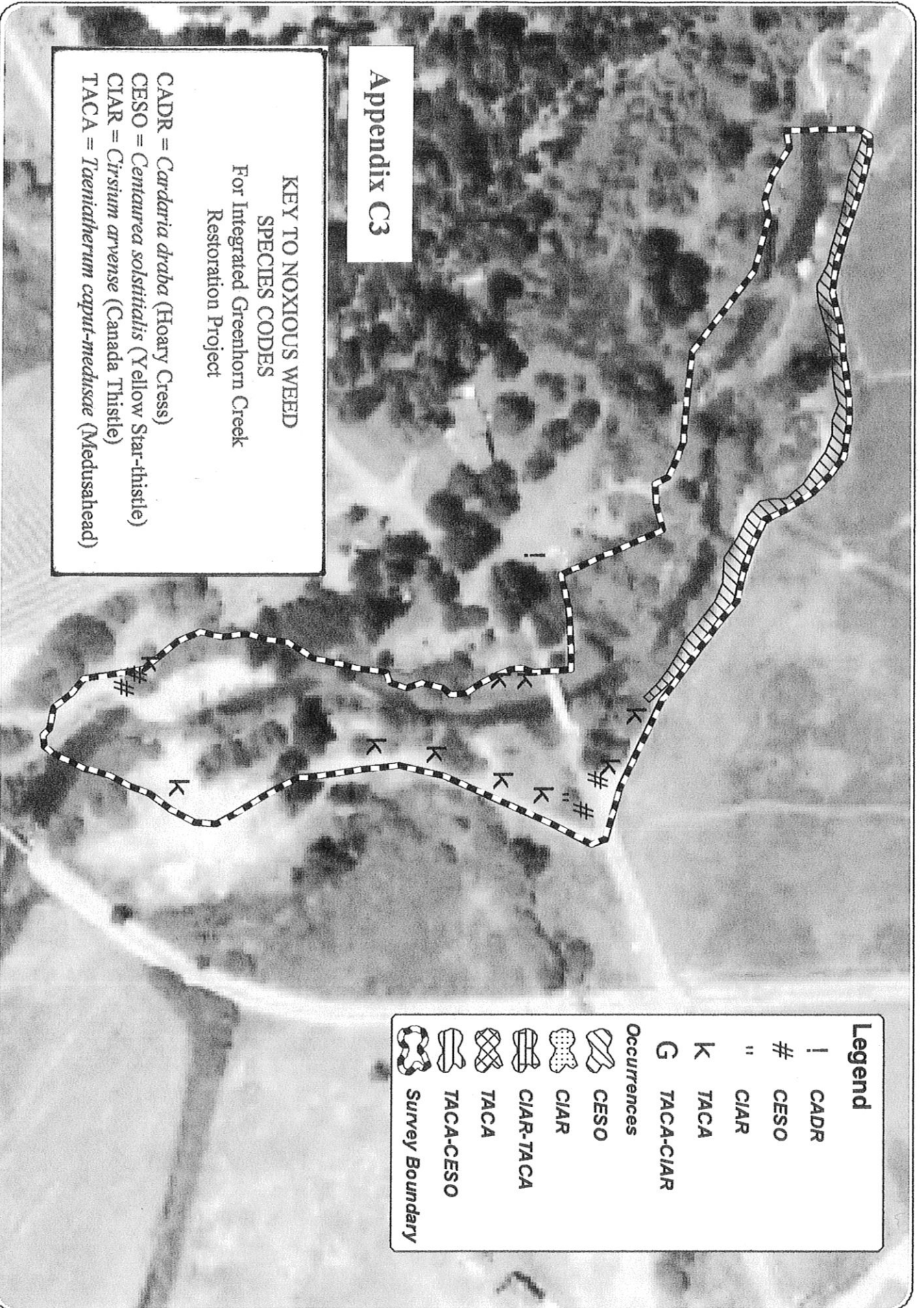
# Appendix C3

KEY TO NOXIOUS WEED  
SPECIES CODES  
For Integrated Greenhorn Creek  
Restoration Project

CADR = *Cardaria draba* (Hoary Cress)  
CESO = *Centaurea solstitialis* (Yellow Star-thistle)  
CIAR = *Cirsium arvense* (Canada Thistle)  
TACA = *Taeniatherum caput-medusae* (Medusahed)

**Legend**

	CADR
#	CESO
"	CIAR
K	TACA
G	TACA-CIAR
<b>Occurrences</b>	
	CESO
	CIAR
	CIAR-TACA
	TACA
	TACA-CESO
	Survey Boundary



0 37.575 150 225 300  
Feet  
Scale 1:1,800

Greenhorn Creek Restoration  
Carol Lane East Bridge

James Battaglin  
Butterfly Botanical Consultants

Compiled By D.M. Churrah  
8/22/2010

# Legend

- I CADR
- # CESO
- " CIAR
- K TACA
- G TACA-CIAR
- Occurrences
- CEISO
- CIAR
- CIAR-TACA
- TACA
- TACA-CEISO
- Survey Boundary

## Appendix C4

### KEY TO NOXIOUS WEED SPECIES CODES For Integrated Greenhorn Creek Restoration Project

CADR = *Cardaria draba* (Hoary Cress)  
 CESO = *Centaurea solstitialis* (Yellow Star-thistle)  
 CIAR = *Cirsium arvense* (Canada Thistle)  
 TACA = *Taeniatherum caput-medusae* (Medusahead)

Access road →

0 25 50 100 150 200  
Feet

Scale 1:1,000

Greenhorn Creek Restoration  
Reid / PNF

James Battaglin  
Butterfly Botanical Consultants

Compiled By D.M. Churchill  
8/2/2010



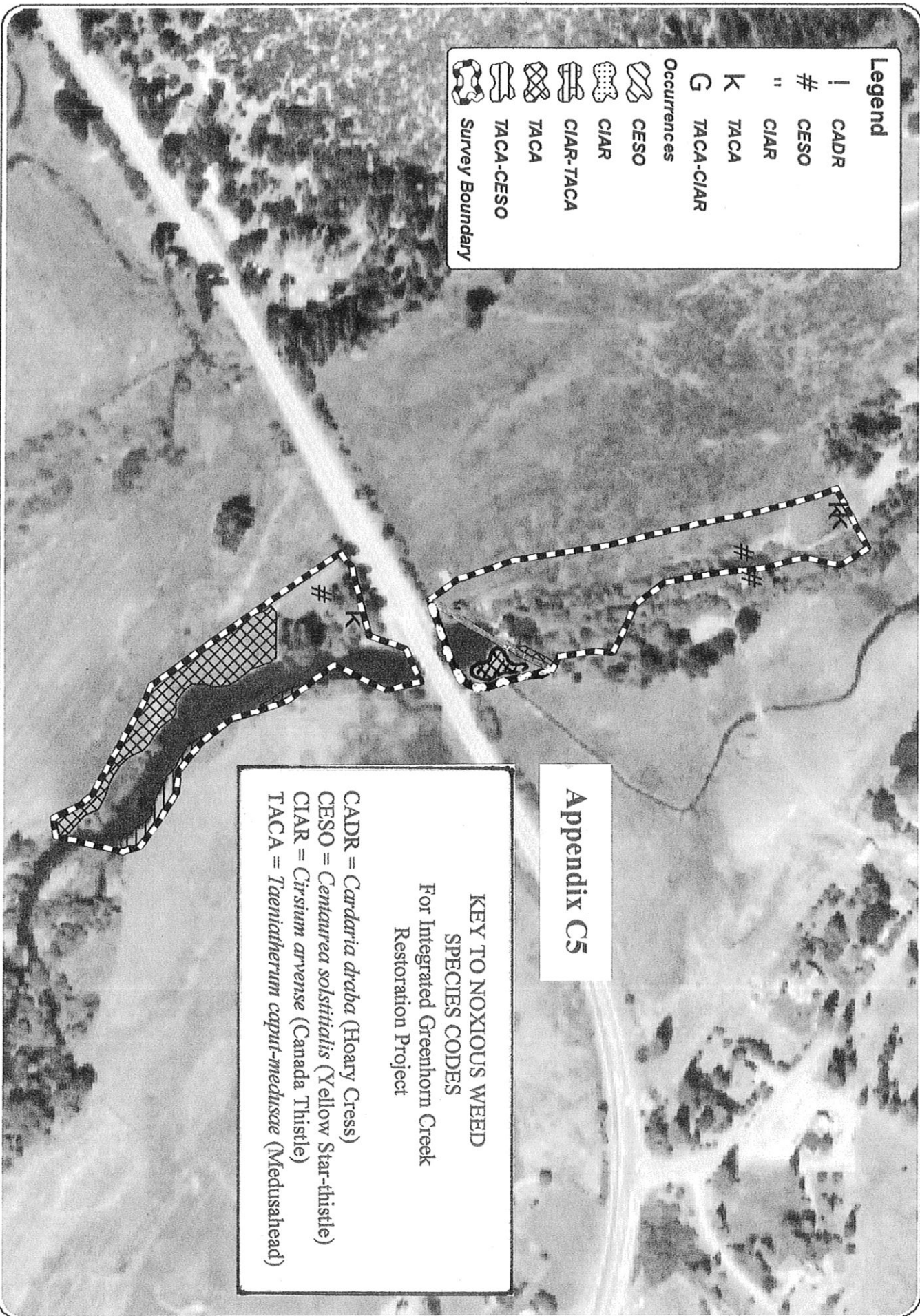
# Legend

I	CADR
#	CESO
"	CIAR
K	TACA
G	TACA-CIAR
Occurrences	
	CESO
	CIAR
	CIAR-TACA
	TACA
	TACA-CESO
	Survey Boundary

## Appendix C5

### KEY TO NOXIOUS WEED SPECIES CODES For Integrated Greenhorn Creek Restoration Project

CADR = *Cardaria draba* (Hoary Cress)  
 CESO = *Centaurea solstitialis* (Yellow Star-thistle)  
 CIAR = *Cirsium arvense* (Canada Thistle)  
 TACA = *Taeniatherum caput-medusae* (Medusahed)



0 75 150 300 450 600  
 Feet  
 Scale 1:3,000

Greenhorn Creek Restoration  
 Reid Dam / Scoppwer

James Battagin  
 Butterfly Botanical Consultants  
 Compiled By D.M. Churchill  
 8/22/10

## Appendix D

### BOTANICAL PREFIELD REVIEW INFORMATION

**Project Name:**

### INTEGRATED GREENHORN CREEK RESTORATION PROJECT

**USFS District:** Mt. Hough R.D., Plumas National Forest

**Reviewer:** Jim Battagin, Butterfly Botanical Consultants

**Title:** Botanical Consultant

**Date:** June 5, 2010

No known occurrences of species of concern are previously known from within the Proposed Project area.

Species of concern with known occurrences in the general vicinity of the Proposed Project area (information attained from the USFS, Mt. Hough Ranger District, Plumas National Forest and from the California Natural Diversity Database):

**Species**

**Rating**

*Lupinus dalesae*

Sensitive

*Pseudostellaria sierrae*

Special Interest, category 2

Other species of concern with potential to be within the Proposed Project boundaries:

**Species**

**Rating**

*Cypripedium montanum*

Sensitive

*Carex sheldonii*

Special Interest, category 2

*Orcuttia tenuis*

USFWS Threatened

## Appendix E

### BOTANICAL FIELD RECONNAISSANCE REPORT

#### INTEGRATED GREENHORN CREEK RESTORATION PROJECT

**REPORTER:** Jim Battagin

**DATE:** June 30, 2010

**JOB TITLE:** Consultant Botanist

**F.S. DISTRICT:** Mt. Hough

**QUAD:** Quincy, CA. USFS map # 29. 589-2C. / Spring Garden, CA. USFS map # 30. 589-1C.

**LEGAL SUBDIVISION:** T24, R10, portions of sections 7, 8, 16, 17 and 21. See maps.

**LOCATION:** American Valley near Quincy, CA. Paralleling Chandler Road from Highway 70 on the south to Quincy Junction Road on the north.

#### RECONNAISSANCE:

**Date(s) of field work:** June 11-16, 2010.

**By:** Jim Battagin

**Number of acres surveyed:** Approx. 34 acres.

**The following type of reconnaissance was conducted in the project area:**

Cursory: \_\_\_\_\_ General: \_\_\_\_\_ Complete:   X   Intuitive controlled:   X  

**The reconnaissance was conducted in the following manner:** The entire project area was viewed from various distances. Areas that were thought to be potential habitat for target species were viewed more closely.

**The area indicated on the attached map was surveyed for the following species of concern as determined by the Botanical Prefield Review Information:**

*Carex sheldonii*, (Sheldon's Sedge), *Lupinus dalesae* (Quincy Lupine) and *Pseudostellaria sierrae* (Sierra Starwort), and *Cypripedium montanum* (Mountain Lady's Slipper).

**Following the botanical survey, only the below listed species may have had potential habitat within the survey area although none was positively identified:**

**Sensitive Plant Species:** None.

**Report occurrences (Category 2):** *Carex sheldonii*.

**Species located:** None.

**Unoccupied habitat located:** No unoccupied habitat was positively identified. However, possible marginal habitat may have existed.

### **HABITAT TYPES INVESTIGATED:**

**HABITAT TYPE 1:** Degraded creek channel.

**Habitat description 1:** Incised perennial stream channel. Gravel, rubble and cobble bars are occasional. Some unstable banks and channels mostly with alder and willow in various successional states.

**HABITAT TYPE 2:** Mostly pine forest.

**Habitat description 2:** Ponderosa Pine forest areas adjacent to the creek, fair plant diversity and a mostly continuous plant cover.

**HABITAT TYPE 3:** Grazed and ungrazed meadow.

**Habitat description 3:** Heavily grazed, compacted, and de-watered meadows. Consists almost entirely of introduced plant species with a high incidence of noxious weeds.

**Appendix F**  
**PLANT SPECIES LIST AND INFORMATION**  
**INTEGRATED GREENHORN CREEK RESTORATION**  
**PROJECT**

Date: June 20, 2010

Dates of field work: June 11-16, 2010

**Note:** Introduced plant species are typed in **bold** print.

**TREES:**

<i>Alnus rhombifolia</i>	White Alder
<i>Calocedrus decurrens</i>	Incense Cedar
<i>Pinus ponderosa</i>	Ponderosa Pine
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	Black Cottonwood
<i>Quercus kelloggii</i>	California Black Oak
<i>Salix laevigata</i>	Red Willow

**SHRUBS:**

<i>Ceanothus integerrimus</i>	Deer Brush
<i>Cornus sericea</i> var. <i>sericea</i>	Creek Dogwood
<i>Mahonia aquifolium</i>	Hollyleaf Oregon-grape
<i>Prunus virginiana</i>	Western Chokecherry
<i>Ribes nevadense</i>	Sierra Current
<i>Rubus leucodermis</i>	Western Raspberry
<i>Rosa woodsii</i>	Interior Wildrose
<i>Salix exigua</i>	Narrow-leaved Willow
<i>Salix lemmonii</i>	Lemmon's Willow
<i>Salix lucida</i> ssp. <i>lasiandra</i>	Shining Willow
<i>Spiraea douglasii</i>	Meadow Sweet
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	Common Snowberry

## GRASSES AND GRAMINOIDS:

Achnatherum lemmonii  
Alopecurus aequalis  
**Alopecurus pratensis**  
**Arrhenatherum elatius**  
**Avena fatua**  
Bromus carinatus  
**Bromus hordeaceus**  
**Bromus japonicus**  
**Bromus rigidus**  
**Bromus madritensis var. rubens**  
**Bromus tectorum**  
Carex amplifolia  
Carex angustata  
Carex athrostachya  
Carex feta  
Carex lanuginosa  
Carex nudata  
Carex pachystachya  
Carex stipata var. stipata  
Carex subfusca  
Carex utriculata  
**Dactylis glomerata**  
Deschampsia danthonoides  
Deschampsia elongata  
Eleocharis parishii  
Elymus glaucus ssp. glaucus  
Elymus trachycaulus  
**Festuca pratensis**  
**Holcus lanatus**  
**Hordeum leporinum (murinum)**  
Juncus bufonius var. bufonius  
Juncus covellii var. obtusatus  
Juncus effusus var. effusus  
Juncus ensifolius  
Juncus macrandrus  
Juncus tenuis var. tenuis  
**Lolium perenne**  
Melica geyeri  
Phalaris arundinaceae  
**Phleum pratense**

Lemmon's Needlegrass  
Little Meadow Foxtail  
**Meadow Foxtail**  
**Tall Oatgrass**  
**Wild Oats**  
California Brome  
**Soft Chess** (*Bromus mollis* – Clifton)  
**Japanese Chess**  
**Ripgut Brome**  
**Foxtail Brome**  
**Cheatgrass**  
Large-leaved Sedge  
Well-fruited Sedge  
Slender-beaked Sedge  
Green-sheathed Sedge  
Woolly Sedge  
Torrent Sedge  
Thick-headed Sedge  
Awl-fruited Sedge  
Sierra Slender Sedge  
Beaked Sedge  
**Orchard Grass**  
Annual Hairgrass  
Slender Hairgrass  
Parish's Spike-rush  
Blue Wildrye  
Slender Wheatgrass  
**Meadow Fescue**  
**Velvet Grass**  
**Hare Barley**  
Common Toad Rush  
Coville's Rush  
Common Pacific Rush  
Swordleaf Rush  
Long-anthered Rush  
Slender or Poverty Rush  
**English Rye Grass**  
Geyer's Onion Grass  
Tall Reedgrass  
**Common Timothy**



**Poa bulbosa**  
**Poa pratensis**  
 Scirpus microcarpus  
**Taeniatherum (Elymus) caput-medusae**  
**Triticum aestivum**  
**Vulpia myuros var. myuros**

**Bulbous Bluegrass**  
**Kentucky Bluegrass**  
 Small-fruited Bulrush  
**Medusa-head**  
**Wheat**  
**Rattail Fescue**

#### ALL OTHER PLANTS:

Achillea millefolium  
 Amsinckia intermedia  
 Aquilegia formosa  
 Artemisia douglasiana  
**Brassica hirta**  
**Capsella bursa-pastoris**  
 Cardamine breweri  
**Cardaria draba**  
**Centaurea cyanus**  
**Centaurea solstitialis**  
**Cerastium fontanum ssp. vulgare**  
**Chrysanthemum leucanthemum**  
**Cicorium intybus**  
 Cicuta douglasii  
**Cirsium arvense**  
 Clarkia purpurea var. viminea  
 Claytonia perfoliata  
 Claytonia rubra  
 Collomia grandiflora  
**Convolvulus arvensis**  
 Crataegus douglasii  
**Dipsacus fullonum**  
 Draba verna  
 Epilobium brachycarpum  
 Epilobium glaberrimum var. g.  
 Epilobium lactuflorum  
 Eriogonum vimineum  
 Equisetum arvense  
 Equisetum hyemale  
**Erodium cicutarium**  
 Eschscholzia californica  
 Galium aparine  
 Heracleum lanatum

Common Yarrow  
 Rancher's Fiddleneck  
 Crimson Columbine  
 Mugwort  
**White Mustard**  
**Shepherds Purse**  
 Brewer's Bitter-cress  
**Heart-podded Hoary Cress**  
**Bachelor's Button**  
**Yellow Star-thistle**  
**Common Mouse-ear Chickweed**  
**Ox-eye Daisy**  
**Chicory**  
 Water Hemlock  
**Canada Thistle**  
 Four-spotted Clarkia  
 Miner's Lettuce  
 Red Miner's Lettuce  
 Large-flowered Collomia  
**Field Bindweed**  
 Douglas' Thorn-apple  
**Fuller's Teasel**  
 Belly Plant  
 Panicked Willow-herb  
 Glaucous Willow-herb  
 White-flowered Willow-herb  
 Wicker-stem Eriogonum  
 Common Horsetail  
 Common Scouring-rush  
**Red-stemmed filaree**  
 California Poppy  
 Cleavers, Goose-grass  
 Cow Parsnip

**Hesperis matronalis**  
**Hypericum perforatum**  
**Lactuca serriola**  
**Lamium amplexicaule**  
 Lathyrus nevadensis  
 Lathyrus sulphurius  
**Lepidium campestre**  
**Lotus corniculatus**  
 Lotus oblongifolia  
 Lotus purshianus  
 Lupinus bicolor  
**Lychnis coronaria**  
**Lythrum hyssopifolia**  
 Madia gracilis  
**Matricaria matricarioides**  
**Medicago sativa**  
**Medicago lupulina**  
**Melilotus albus**  
**Mentha spicata**  
 Mimulus cardinalis  
 Mimulus guttatus  
**Myosotis scorpioides**  
 Myosotis discolor  
 Phacelia mutabilis  
**Plantago lanceolata**  
 Polygonum douglasii  
 Polygonum pennsylvanicum  
 Potentilla gracilis ssp. nuttallii  
 Prunella vulgaris ssp. lanceolata  
 Ranunculus aquatilis ssp. capillaceus  
 Ranunculus occidentalis  
 Ranunculus orthorhynchus  
 Ranunculus uncinatus  
 Rorippa curvisiliqua  
 Rorippa nasturtium-aquaticum  
**Rubus discolor**  
**Rubus laciniatus**  
**Rumex acetosella**  
**Rumex crispis**  
 Rumex salicifolia  
 Scutellaria bolanderi  
**Silene vulgaris**  
**Sinapis arvensis**

**Dame Rocket, Sweet Rocket**  
**Klamath Weed**  
**Prickly Lettuce**  
**Henbit**  
 Sierra Nevada Pea  
 Snub Pea  
**Common Peppergrass**  
**Birdsfoot Trefoil**  
 Oblong-leaved Lotus  
 Spanish Clover  
 Annual Lupine  
**Mullein Pink, Multeese Cross**  
**Hyssop Loosestrife**  
 Slender Tarweed  
**Pineapple Weed**  
**Alfalfa**  
**Black Medic**  
**White Sweet-clover**  
**Spearmint**  
 Scarlet Monkey-flower  
 Common Monkey-flower  
**Forget-me-not**  
 Yellow and Blue Scorpion-grass  
 Changeable Phacelia  
**Ribgrass**  
 Knotweed  
 Pennsylvania Persicaria  
 Slender Cinquefoil  
 Self-heal  
 Water Buttercup  
 Western Buttercup  
 Straight-beaked Buttercup  
 Uncinate-fruited Buttercup  
 Curve-fruited Yellow Cress  
 Water Cress  
**Himalaya-berry**  
**Cut-leaved Blackberry**  
**Sheep sorrel**  
**Curly Dock**  
 Willow Dock  
 Bolander's Skullcap  
**Inflated Campion**  
**Common Sinapis**

**Spergularia rubra**  
 Stachys ajugoides var. rigida  
**Tanacetum vulgare**  
**Taraxicum officinale**  
**Thlaspi arvense**  
**Tragopogon pratensis**  
**Trifolium dubium**  
**Trifolium hirtum**  
**Trifolium pratense**  
**Trifolium repens**  
 Typha latifolia  
**Valerianella locusta**  
**Verbascum thapsus**  
 Veronica americana  
 Veronica serpyllifolia ssp. humifusa  
 Vicia Americana

**Ruby Sandspurry**  
 Bugle Hedge Nettle  
**Common Tansy**  
**Common Dandelion**  
**Field Penny Cress**  
**Meadow Salsify, Goat's-beard**  
**Shamrock**  
**Rose Clover**  
**Red Clover**  
**White Clover**  
 Soft Flag, Cattail  
**Corn Salad**  
**Common Mullein**  
 American Speedwell  
 Thyme-leaved Speedwell  
 American Vetch

Total number of plant species: 155

Number of introduced species: 63

*The following plants were the most common plants found in the project area:*

**Bromus hordeaceus**  
**Hordeum leporinum (murimum)**  
 Phalaris arundinaceae  
**Vulpia myuros var. myuros**  
 Epilobium brachycarpum  
 Madia gracilis

**Soft Chess**  
**Hare Barley**  
 Tall Reedgrass  
**Rattail Fescue**  
 Panicked Willow-herb  
 Slender Tarweed

*The following plants were the least common in the project area (the least common being at the top of the list and there being no more than 10 plants of any species listed):*

Mahonia aquifolium  
 Achnatherum lemmonii  
**Avena fatua**  
 Melica geyeri  
**Cardaria draba**  
 Clarkia purpurea var. viminea  
 Crataegus douglasii  
 Mimulus cardinalis  
**Rubus laciniatus**  
**Thlaspi arvense**

Hollyleaf Oregon-grape  
 Lemmon's Needlegrass  
**Wild Oats**  
 Geyer's Onion Grass  
**Heart-podded Hoary Cress**  
 Four-spotted Clarkia  
 Douglas' Thorn-apple  
 Scarlet Monkey-flower  
**Cut-leaved Blackberry**  
**Field Penny Cress**

## **Appendix G**

### **Integrated Greenhorn Creek Restoration Project**

#### **Noxious Weed Risk Assessment**

**Prepared by:** /s/ Jim Battagin **Date:** 9-10-10  
Jim Battagin, Butterfly Botanical Consultants

# Noxious Weed Risk Assessment

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# INTRODUCTION

This Noxious Weed Risk Assessment has been prepared to evaluate the effect of a stream restoration project and adjacent ground disturbance for the Proposed Integrated Greenhorn Creek Restoration Project on California Department of Food and Agriculture (CDFA) listed noxious weeds and other invasive non-native plant species. This assessment is in compliance with the Plumas National Forest Land and Resource Management Plan (USDA Forest Service 1988), the Herger-Feinstein Quincy Library Group Forest Recovery Act Final Environmental Impact Statement (USDA Forest Service 1999), the Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement Record of Decision (USDA Forest Service 2001), Executive Order on Invasive Species (Executive Order 13112), and the direction in the Forest Service Manual section 2080, Noxious Weed Management (amendment effective since 11/29/95) (USDA Forest Service 1991), which includes a policy statement calling for a risk assessment for noxious weeds to be completed for every project. The overriding principle stated in these documents is that "...it is much cheaper to prevent an infestation from becoming established than to try to eliminate it once it has begun to spread, or deal with the effects of a degraded plant community." Specifically, the manual states: 2081.03 - Policy. When any ground disturbing action or activity is proposed, determine the risk of introducing or spreading noxious weeds associated with the proposed action.

1. For projects having moderate to high risk of introducing or spreading noxious weeds, the project decision document must identify noxious weed control measures that must be undertaken during project implementation.
2. Use contract and permit clauses to prevent the introduction or spread of noxious weeds by contractors and permittees. For example, where determined to be appropriate, use clauses requiring contractors or permittees to clean their equipment prior to entering National Forest System lands.

2081.2 - Prevention and Control Measures. Determine the factors that favor the establishment and spread of noxious weeds and design management practices or prescriptions to reduce the risk of infestation or spread of noxious weeds.

Where funds and other resources do not permit undertaking all desired measures, address and schedule noxious weed prevention and control in the following order:

1. First Priority: Prevent the introduction of new invaders,
2. Second Priority: Conduct early treatment of new infestations, and
3. Third Priority: Contain and control established infestations.

## Analysis Methods

### Surveys

Botanical surveys covering approximately 34 acres were conducted for the Area in the summer of 2010 for rare plants, special habitats, and noxious weeds by Jim Battagin of Butterfly Botanical Consultants.

The risk of noxious weed establishment takes into account a variety of factors:

1. Mapping of noxious weed species,
2. Size of existing known populations,
3. Treatment of known populations,
4. Standard Operating Procedures or Standard Management Requirements,

### Geographic Analysis Area:

The Integrated Greenhorn Creek Restoration Project area encompasses approximately 34 acres. The area of analysis for noxious weed risk assessment includes only the Proposed Project area.

### Timeframe:

No noxious weed records exist for the Project area.

## NON-PROPOSED ACTION DEPENDENT FACTORS

### INVENTORY

A complete noxious weed survey was conducted in the project analysis area by Jim Battagin of Butterfly Botanical Consultants

There are no recorded noxious weed species within the Project area boundary. Although the area of this survey does not include any areas outside the Project area, it is often helpful to be aware of any known locations near the Project area. In querying the Mount Hough District of the Plumas National Forest records, several locations of noxious weeds within 2 miles of the Project area were discovered, they are:

<i>Cirsium arvense</i> (Canada thistle)	1 location
<i>Centaurea solstitialis</i> (Yellow star-thistle)	20 locations
<i>Taeniatherum caput-medusae</i> (Medusahead)	18 locations

None of the above occurrences of noxious weeds are located in American Valley Proper, but are in close proximity on the hillsides surrounding the valley.

## SURVEY RESULTS

The California Department of Food and Agriculture's noxious weed list (<http://www.cdfa.ca.gov>) divides noxious weeds into categories A, B, and C. A-listed weeds are those for which eradication or containment is required at the state or county level. With B-listed weeds, eradication or containment is at the discretion of the County Agricultural Commissioner. C-listed weeds require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner.

There are no known occurrences of A-listed weed species in the analysis area. However, there is one species on the B list and two species on the C list:

**A-listed weeds: eradication or containment is required at the state or county level**

None are known to be present.

**B-listed weeds: eradication or containment is at the discretion of the County Agricultural Commissioner**

*Cirsium arvense* is a B-listed weed and was found within the Proposed Project area. The plant locations are generally spotted throughout the entire project area and will more than likely be unavoidable during Project implementation. See maps.

**C-listed weeds: require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner**

*Centaurea solstitialis* and *Taeniatherum caput-medusae* are C-listed weeds and were found within the Proposed Project area. The plant locations are generally spotted throughout the entire project area and will more than likely be unavoidable during Project implementation. See maps.

*Note:* In addition, one occurrence of *Cardaria draba* (Hoary Cress), a B-listed noxious weed was discovered immediately adjacent to the Carol Lane East Bridge portion of the project (see map for location). This noxious weed has been reported to the office of the Plumas County Agricultural Commissioner (specifically to Tim Gibson) for consideration for eradication when it flowers again in June of 2011.

Overall, risk of noxious weed expansion from existing occurrences within the Project area is high.



## **HABITAT VULNERABILITY**

Vulnerability to noxious weed invasion and establishment is greatly influenced by plant cover, soil cover, noxious weed seed source and over-story shade. These factors vary across the project area. Other areas of risk in this proposed project area are those located next to roads. Roads provide dispersal of exotic species via three mechanisms: providing habitat by altering conditions, making invasion more likely by stressing or removing native species, and allowing easier movement by wild or human vectors. These factors contribute to a high risk of noxious weed invasion.

## **NON-PROJECT DEPENDENT VECTORS**

Many vectors exist for the dissemination of noxious weed seed. A few of these might be cattle, birds, wind, water and various motor vehicles such as ATV's, farm trucks and motorcycles

## **PROPOSED ACTION DEPENDENT FACTORS**

The greatest risk of infection in this stream restoration project is probably at the time of construction and the consequent possible introduction of weed seed from areas already infected within the Project area to newly disturbed soil. Even if this threat is properly dealt with (see "Standard Operating Procedures" below), there is a high probability of spreading weed seed due to the many areas of noxious weeds already present in many parts of the Proposed Project area.

## **HABITAT ALTERATION EXPECTED AS A RESULT OF PROJECT**

The purpose of the Proposed Action is to restore and/or strengthen portions of streambank along Greenhorn Creek in order to improve water quality and riparian habitat and to prevent accelerated bank erosion. Existing vertical banks with no current vegetation will be sloped to a point where vegetation will be able to become established. The stabilizing influence of the vegetated banks is the main purpose of the Proposed Project.

## INCREASED VECTORS AS A RESULT OF PROJECT IMPLEMENTATION

Vehicles, personnel, and earth moving equipment are all vectors that can carry noxious weed seed and/or plant parts into and/or around the area during construction. Equipment washing, as explained below, will help to reduce the risk of inter-project transfer and of introducing new species of noxious weeds from outside the Project area. Vectors should decrease as known noxious weed populations are designated on the ground. After construction, there would be no additional vectors than currently exist.

## MANAGEMENT MITIGATIONS

As outlined above, there are many areas within the Proposed Project area that house noxious weeds. Since none are A-listed, it is not required by law to eradicate them. However, they still have a deleterious effect on the native vegetation, wild animals and farm animals. Without eradication prior to project implementation, some amount of spread of these noxious weeds is virtually assured. On the other hand, the complete eradication of these same weeds is almost humanly impossible.

Since this restoration project is an important one to the health of Greenhorn Creek, it would seem prudent to try to proceed with it while still paying close attention to minimizing the spread and/or introduction of additional noxious weeds. This reporter recommends that areas with noxious weeds be well-marked so that:

1. Treatment of known areas of noxious weeds in areas that may be accessed or disturbed by project activities prior to construction will reduce the noxious weed seed produced.
2. Whenever possible, people and equipment can be kept out of these areas. Weed areas should be flagged for easy avoidance.
3. Upon project completion, these areas, and all disturbed ground, are sown with appropriate native and non-native grasses at the proper time of year as established by a professional botanist or someone in that field of work. Appropriate species to use include:

<i>Agrostis stolonifera</i>	Introduced*	moist to wet
<i>Deschampsia cespitosa</i>	Native	moist to wet
<i>Elymus glaucus</i>	Native	upland
<i>Elymus triticoides</i>	Native	moist/vernal
<i>Festuca rubra</i>	Native	upland to moist
<i>Hordeum brachyantherum</i>	Native	moist to wet
<i>Phleum pretense</i>	Introduced*	moist to wet

Poa pratensis                                      Introduced\*                                      upland to moist

\*Introduced plants would only be used at the discretion of the Mt Hough District Botanist during the season of collection and sowing.

(If seeds cannot be locally collected, they can be ordered from Comstock Seed (775-265-0090), and should be ordered also from at least one other source to ensure genetic diversity. Seeds should be sown as soon as possible after ground disturbance is complete, ideally in the fall of the year.)

4. Following project implementation and subsequent seeding, disturbed areas can be monitored for 3 years in an attempt to determine the success of the seeding effort and level of infestation of noxious weeds. It may be determined during that time if a weeding effort is feasible or desired.

5. Construction logistics can be planned to avoid spreading weeds from one treatment area to another.

## **STANDARD OPERATING PROCEDURES (SOP)**

The SOP are based on the priorities established in FSM 2081.2 which states “where funds and other resources do not permit undertaking all desired measures, address and schedule noxious weed prevention and control in the following order:

1. First Priority: Prevent the introduction of new invaders,
2. Second Priority: Conduct early treatment of new infestations, and
3. Third Priority: Contain and control established infestations.”

1. Prevention/Cleaning: Require all off-road equipment and vehicles (Forest Service and contracted) used for project implementation to be weed-free. Clean all equipment and vehicles of all attached mud, dirt and plant parts. This will be done at a vehicle washing station or steam cleaning facility before the equipment and vehicles enter the project area. Cleaning is not required for vehicles that will stay on the roadway. Also, all off-road equipment must be cleaned prior to leaving areas infested with noxious weeds.

2. Prevention/Road Construction, Reconstruction, and Maintenance: All earth-moving equipment, gravel, fill, or other materials need to be weed free. Use onsite sand, gravel, rock or organic matter where possible.

3. Prevention/Revegetation: Use weed-free equipment, mulches, and seed sources. Avoid seeding in areas where revegetation will occur naturally, unless noxious weeds are a concern. Save topsoil from disturbance and put it back to use in onsite revegetation, unless contaminated with noxious weeds. All activities that require seeding or planting will need to use only locally collected native seed sources or other appropriate species. Plant and seed material should be collected from as

close to the project area as possible, from within the same watershed and at a similar elevation whenever possible. Persistent non-natives such as timothy, orchard grass, or ryegrass will be avoided (but considered). This will implement the USFS Region 5 policy that directs the use of native plant material for revegetation and restoration for maintaining “the overall national goal of conserving the biodiversity, health, productivity, and sustainable use of forest, rangeland, and aquatic ecosystems”.

4. Prevention/Staging Areas: Do not stage equipment, materials, or crews in noxious weed infested areas where there is a risk of spread to areas of low infestation.
5. Infestations will be treated (in this case, by seeding in areas with noxious weeds that were disturbed).

## ANTICIPATED WEED RESPONSE TO PROPOSED ACTION

Table 2. Anticipated Weed Response

Factors	Variation	Risk
<b>NON-PROPOSED ACTION DEPENDENT FACTORS</b>		
1. Inventory	Complete	Low
2. Known Noxious Weeds	3 species, One B and two C	N/A
3. Habitat vulnerability	High cover, Low to moderate disturbance	Low current vulnerability
4. Non-project dependent vectors	Moderate current vectors	Low to moderate current vulnerability
<b>PROPOSED ACTION DEPENDENT FACTORS</b>		
5. Habitat alteration expected as a result of project.	Intensive ground disturbance in limited areas	High
6. Increased vectors as a result of project implementation	Vehicles, personnel, and equipment; equipment cleaned per SOP	High
7. Mitigation measures	No SOP measures or mitigations implemented	High
	Some SOP measures implemented	High
	All SOP measures implemented	Probably moderate
8. Anticipated weed response to proposed action	Some or no SOP measures implemented	High potential for significant increase in weed spread as a result of project implementation
	All SOP measures implemented	Moderate potential for weed spread as a result of project implementation

9. Cost estimates	<p>Purchase and dissemination of seed is estimated at about \$2400. For 3 yrs after project:</p> <p>Mapping, monitoring, and control are expected to take 2 people, 2 days/year @ \$200 per day per person for a total of \$800 for one year and \$2400 for the 3 years.</p>	<p>This money would allow grass seeding and monitoring for 3 years. Pre-project data in areas that are positively determined to be disturbed would be very helpful in determining the effect of seeding these areas.</p>
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## COSTS

Noxious weeds significantly reduce the value of all lands. Noxious weeds negatively impact timber production, grazing, wildlife habitat, and recreational opportunities. Furthermore, noxious weed control is expensive and time consuming. Prevention and control of small infestations can reduce these impacts and reduce expenditures in the long run. Thus, noxious weed surveys, control of small infestations, and prevention measures are vital in reducing overall impacts and costs from noxious weeds. Cost estimates are listed above.

## SUMMARY

There are three noxious weed species located in the analysis area and some of the occurrences are quite extensive. The implementation of the Integrated Greenhorn Creek Restoration Project is predicted to result in a low to moderate potential for weed introduction and spread if all SOP (Standard Operating Procedures) and mitigations (see MANAGEMENT MITIGATIONS on Page 6 above) are adopted. If no noxious weed SOP or mitigations are incorporated into the project it is likely that the introduction and spread of noxious weeds would be high. This determination is based on the following:

1. The large number of known occurrences.
2. Clear mapping and flagging of noxious weed occurrences.
3. Implementation of SOP's and mitigations.
4. Monitoring and treatment of disturbed areas for 3 years after project implementation.

# **Biological Assessment and Biological Evaluation**

**For**

## **Integrated Greenhorn Creek Restoration Project**

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**March 23, 2011**

## **INTRODUCTION**

The purpose of this Biological Assessment (BA)/Biological Evaluation (BE) is to review the proposed project in sufficient detail to determine its effect on species of concern. Specifically, BE's are completed to determine whether a proposed action will result in a trend toward a Forest Service sensitive species becoming Federally listed. BA's are completed to document effect on proposed, threatened or endangered species, and/or critical habitat; and to determine whether formal consultation or conference with U.S. Fish and Wildlife Service (USFWS) or CA Dept. of Fish & Game (CDFG) is required. The most current list of Threatened, Endangered and Sensitive (TES) were queried within the California Natural Diversity Database (CNDDDB) and US Fish and Wildlife Service's most current TES species lists (Table 1). This Biological Assessment conforms with legal requirements set forth under Section 7 of the Endangered Species Act and standards established in Forest Service Manual direction (FSM 2672.42) for projects on Plumas National Forest (PNF) land.

The Greenhorn Creek Integrated Restoration (GCIR) project is located in the American Valley Quincy, CA, in Plumas County along Greenhorn Creek, Sections 16, 17, 8, 7 of Township 24N/Range 10E. The watercourse moves east to west through the wide-spanning valley and eventually joins with Spanish Creek at the northwest end of the valley.

**TABLE 1: Threatened, Endangered, Proposed and Sensitive Animal Species that Potentially Occur on the Plumas National Forest, as of April 29, 2010.**

Species	Category
<b><u>INVERTEBRATES</u></b>	
Valley elderberry longhorn beetle ( <i>Desmocerus californicus dimorphus</i> )	Threatened
<b><u>FISH</u></b>	
Hardhead minnow ( <i>Mylopharodon conocephalus</i> )	Sensitive
<b><u>AMPHIBIANS</u></b>	
California red-legged frog ( <i>Rana aurora draytonii</i> )	Threatened
Foothill yellow-legged frog ( <i>Rana boylei</i> )	Sensitive
Mountain yellow-legged frog ( <i>Rana muscosa</i> )*	Candidate/Sensitive
Northern leopard frog ( <i>Rana pipiens</i> )	Sensitive
<b><u>REPTILES</u></b>	
Pacific pond turtle ( <i>Actinemys marmorata marmorata</i> )	Sensitive
<b><u>BIRDS</u></b>	
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Sensitive
Northern Goshawk ( <i>Accipiter gentiles</i> )	Sensitive
California spotted owl ( <i>Strix occidentalis occidentalis</i> )	Sensitive
Great gray owl ( <i>Strix nebulosa</i> )	Sensitive
Willow flycatcher ( <i>Empidonax trailii brewsteri</i> )	Sensitive
Greater sandhill crane ( <i>Grus canadensis tabida</i> )	Sensitive
Swainson's hawk ( <i>Buteo swainsoni</i> )	Sensitive
<b><u>MAMMALS</u></b>	
Sierra Nevada red fox ( <i>Vulpes vulpes necator</i> )	Sensitive
American marten ( <i>Martes americana</i> )	Sensitive
Pacific fisher ( <i>Martes pennant pacifica</i> )	Candidate
California wolverine ( <i>Gulo gulo luteus</i> )**	Sensitive/Candidate
Pallid bat ( <i>Antrozous pallidus</i> )	Sensitive
Western red bat ( <i>Lasiurus blossevillii</i> )	Sensitive
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	Sensitive

\* discussed in this report as Sierra Nevada yellow-legged frog

\*\*As of December 24, 2010, California wolverine is a candidate species.

Several T&E species identified in the list of T&E species provided by the “Federal Endangered and Threatened Species that may be affected by Projects in the Plumas National Forest”, updated April 29, 2010, accessed via USFWS web page

([http://www.fws.gov/sacramento/es/spp\\_lists/NFActionPage.cfm](http://www.fws.gov/sacramento/es/spp_lists/NFActionPage.cfm)) (Appendix A), have been eliminated from further analysis, based on past analysis and concurrence from the USFWS (HFQLG BA/BE Rotta 1999, USFWS letter 1-1-99-I-1804 dated August 17, 1999) or due to lack of species distribution and/or lack of designated critical habitat. These species are listed below:

- Winter Run Chinook Salmon (*Oncorhynchus tshawytscha*)



- Conservancy Fairy Shrimp (*Branchinecta conservatio*)
- Central Valley steelhead (*Oncorhynchus mykiss*)
- Delta Smelt (*Hypomesus transpacificus*)
- Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)
- Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*)
- Carson wandering skipper (*Pseudocopaodes eunus obscurus*)
- Critical Habitat for vernal pool invertebrates (Butte County)
- Critical habitat for California red-legged frog

In addition, there is no known habitat, have been no observations, and the Integrated Greenhorn Creek Restoration Project Wildlife Analysis Area is above the elevational range for the valley elderberry longhorn beetle, a threatened species. Therefore, this species will not be discussed further in this document. There is also no suitable habitat and have been no observations of the following sensitive species in, or near, the Integrated Greenhorn Creek Restoration Project Wildlife Analysis Area: hardhead minnow, northern leopard frog, Swainson's hawk, and all sensitive forest carnivores (Sierra Nevada red fox, American marten, Pacific fisher, California wolverine). Therefore, these seven species will not be discussed further in this document. Sensitive carnivores also are not likely to occupy habitat with as much residential and agricultural activity as occurs in, and around, the analysis area.

The closest known population of California red-legged frogs to the project area is over 30 air miles southwest of the project area, in a drainage that is directly tributary to the pool of Lake Oroville. It would be nearly impossible for this closest known population to get close to colonizing the project area, with numerous reservoirs, and over 80 stream miles between this population and the project area. The nearest critical habitat is located at approximately 2,200 foot elevation, also over 30 air miles from the project area. Abundant surveys have been conducted throughout the Plumas National Forest over the past 15 years, with no new populations found, nor is any critical habitat located within Plumas County. No CaRLF individuals were found during project-specific surveys for the Integrated Greenhorn Creek Restoration Project. Therefore this species would not be affected by the Proposed Action, and will not be discussed further.

At the end of this document, Table 5 displays the Wildlife BA/BE determinations for the remaining species listed in Table 1. These species are discussed further below.

### **CONSULTATION TO DATE**

From February 10, to August 3, 1999, a series of informal meetings and written correspondence occurred between the USDA Forest Service and USFWS regarding the development of the HFQLG FEIS (See programmatic Biological Assessment and Evaluation of Herger-Feinstein Quincy Library Group Forest Recovery Act (Rotta 1999) pg 5, for specific topics discussed and timelines). As a result, the Forest

Service incorporated the recommended measures provided by USFWS for the bald eagle and California red-legged frog (USFWS 1999).

No consultation specific to the Integrated Greenhorn Creek Restoration Project was done. A list of T&E species was provided by the “Federal Endangered and Threatened Species that may be affected by Projects on the Plumas National Forest”, updated April 29, 2010, accessed via USFWS county list web page ([http://www.fws.gov/sacramento/es/spp\\_lists/NFActionPage.cfm](http://www.fws.gov/sacramento/es/spp_lists/NFActionPage.cfm)) (Appendix A). On March 4, 2011 the Proposed Action was sent via email to Terri Weist and Amber Rossi of the California Department of Fish & Game. No issues were raised and no correspondence has occurred since with regard to the Integrated Greenhorn Creek Restoration Project. **NEED TO WAIT TIL END OF SCOPING TO FINALIZE THIS**

### **CURRENT MANAGEMENT DIRECTION**

The proposed project is both on private land within the boundaries of the Plumas National Forest, and on Plumas National Forest lands. Current management direction on private lands within the state of California, Plumas County can be found in the following documents:

- California Environmental Quality Act (CEQA; 1970)
- California Endangered Species Act
- Plumas County General Plan

Current management direction for threatened, endangered, proposed and sensitive species on the PNF can be found in the following documents:

- Code of Federal Regulations (23, 36, 50 CFR)
- Forest Service Manual and Handbooks (FSM/H 1200, 1500, 1700, 2600)
- Endangered Species Act (ESA 1976)
- National Environmental Policy Act (NEPA 1969)
- National Forest Management Act (NFMA 1976)
- Plumas National Forest Land and Resource Management Plan (PNF LRMP 1988)
- Regional Forester (Region 5) policy and management direction
- Regional Forester (Region 5) Sensitive Plant and Animal Species List (June 10, 1998), as appended October 15, 2007
- USFWS Quarterly Species List (updates through January 15, 2009)
- Herger-Feinstein Quincy Library Group Forest Recovery Act (HFQLGFRA) and its implementing Final Environmental Impact Statement (FEIS), Record of Decision (ROD), August 1999

- Sierra Nevada Forest Plan Amendment (SNFPA) and its implementing Final Environmental Impact Statement (FEIS), Record of Decision (ROD), January 2001
- Herger-Feinstein Quincy Library Group Forest Recovery Act (HFQLGFRA) and its implementing Final Supplemental Environmental Impact Statement (FSEIS), Record of Decision (ROD), July 2003
- Sierra Nevada Forest Plan Amendment (SNFPA) and its implementing Final Supplemental Environmental Impact Statement (FSEIS), Record of Decision (ROD), January 2004
- HFQLG/SNFPA Implementation Consistency Crosswalk Update 11/08/2007
- Sierra Nevada Forests Management Indicator Species Amendment FEIS, December 2007
- Bald and Golden Eagle Protection Act of 1940, as amended
- The Migratory Bird Treaty Act of 1918, as amended

Forest Service direction for TES species incorporated in this BA/BE can be found in the Forest Service Manual (FSM 2670.31, FSM 2670.32). Information regarding threatened, endangered, proposed and sensitive animals is also obtained through the cooperation of the USFWS and the CDFG.

The Plumas National Forest Land and Resource Management Plan (PNF LRMP) provides Forest specific information on how TES species will be managed. These include forest wide goals and policies for Wildlife, Fish and Sensitive Plants (p. 4-4) and Riparian Areas (p. 4-7), Wildlife objectives (p. 4-14, 4-15, and 4-19), forest wide direction and standards and guidelines for Wildlife, Fish and Sensitive Plants (p. 4-29 through 4-32). Management Area specific and species-specific direction and prescriptions will be included in the species discussions below. Direction is also found under other areas (e.g., Timber management) that directly or indirectly affect animal species and/or their habitats. This direction is incorporated by reference. The PNF LRMP provides management guidelines that incorporate Regional direction for each species. Current TES and wildlife direction can be found in the PNF LRMP, as amended by the HFQLGFRA FEIS, as amended by SNFPA FSEIS ROD (2004), for Wildlife, Fish, Riparian Ecosystems and riparian-dependent wildlife species. As per the May 10, 2004 letter (and attachments) from the three Forest Supervisors within the HFQLG pilot project area, the 2004 SNFPA ROD replaced the 2001 SNFPA ROD in its entirety and the 2001 ROD, or the 2001 Appendix A should not be used. Attachments to this May 10 letter provide consistent guidance for applying 2004 SNFPA ROD and FSEIS and the HFQLGFRA FEIS.

## **DESCRIPTION OF PROPOSED PROJECT**

Greenhorn Creek is the primary water course through American Valley, and has been used as an important resource for both Euro-American settlers and Native Americans before them. Through recent history, existing uses and property boundaries have taken a toll on the ability of the system to ecologically absorb perturbations. The proposed treatments consider existing land uses, constraints, and channel dynamics, including bedload movement through the Greenhorn Creek system. The two fish passage structures, at

the Shea Dam and Highway 70 irrigation dam (treatments 2 and 5, listed below) would protect the dams from further erosion damage, and stabilize the channel bed and banks. Implementation at any of the treatment sites is not dependent upon implementation at any other site. The following list includes all Greenhorn Integrated Restoration Project treatments considered under this analysis. However it is only treatment number 4, the Reid/PNF treatment unit that is subject to a decision by the Mt Hough District Ranger, as that is the only site that include National Forest System lands. All other treatment sites are located entirely on private land, and will be environmentally reviewed under the California Environmental Quality Act process. The treatments on private lands are analyzed in this document as cumulative effects from reasonable foreseeable future action.

1. Above and below Quincy Junction Rd, boulder vanes would be installed on 1,800 feet of actively eroding banks for stabilization. Access into the APE would be from the Quincy Junction onto an existing ranch access route.
2. At the Shea Dam, 3,000 cubic yards of 4'-minus pit material would be used to create a 200'-long, fish passable riffle-pool structure. Access into the APE would be from the existing gravel driveway, which was constructed of imported fill.
3. At the Carol Lane East Bridge, boulder vanes would be installed along a 240 feet section of channel to stabilize the channel bed and bank. Access into the APE would be on the existing paved road.
4. At the Plumas National Forest/Reid bank, boulder vanes would be installed along a 390-foot section of actively eroding bank. Access into the APE from the paved road would be via an existing dirt ranch road, which was surveyed.
5. At the Highway 70 irrigation dam, 5,000 cubic yards of material would be used to install a 200'-long fish-passable riffle pool structure. Access from the highway would be on an existing dirt ranch road in the APE, which was surveyed.
6. On the Farnworth property, boulder vanes would be installed along a 220 foot section of actively eroding bank. Access from the highway would be on an existing dirt ranch road in the APE, which was surveyed.

Project equipment would include an excavator, a front end loader, and two dump trucks, which would access the treatment units on existing paved roads, one gravel driveway, and three dirt roads.



**Figure 1. Location of six treatment areas.**

## **SCOPE OF ANALYSIS**

### **Geographic Analysis Areas**

The six treatment areas comprise 21.3 acres and 1.3 miles of stream channel within American Valley along Greenhorn Creek. For the purpose of this BA/BE, the Wildlife Analysis Area is defined as this entire portion of American Valley. The wildlife cumulative effects analysis boundary area encompasses 404 acres of both National Forest System (1 acre) and private (403 acres) lands (Figure 2), along 3.9 miles of Greenhorn Creek. This area was chosen for the cumulative effects analysis because it comprises an area similar to those habitats in the project area, i.e. gullied stream channel in an agricultural meadow with dispersed housing. This Wildlife Analysis Area is being used for all wildlife species analyzed in this BA/BE because effects of the project would not extend beyond the Wildlife Analysis Area boundary. The direct and indirect effects of each alternative, together with the additive or cumulative effects of each alternative, have been considered in evaluating impacts to TES species and TES habitat. Only the actual project area treatment polygons were field surveyed.

### **Timeframe for Analysis**

The timeframe used for determining cumulative effects depends on the length of time that lingering effects of the past actions would continue to impact the species in question. For the Integrated Greenhorn Creek Restoration Project, general information based on the history of the area and site specific information based on available data, going back approximately 20 years and forward approximately five years was incorporated.

### **Analysis Methodology**

The Integrated Greenhorn Creek Restoration Project was reviewed for wildlife resources using digital orthophoto quadrangles (DOQs), species specific spatial datasets, and known information to help determine suitable habitat for TES species. The U.S. Forest Service, Mount Hough Ranger District and the California Natural Diversity Database (CNDDB) were consulted for records of special-status wildlife species that potentially occur in the vicinity of the project area. Areas identified as suitable habitat were field surveyed to the following R5 protocols and acceptable standards: “Standardized protocol for Surveying Aquatic Amphibians” (Fellers and Freel 1995); and “A Willow Flycatcher Survey Protocol for California, May 29, 2003” (Bombay, et al. 2003). Surveys for amphibians and willow flycatcher were conducted by Brian Shaw of Klamath Wildlife Resources. Surveys were completed for amphibians on July 28, 2010 with no target species discovered. Willow flycatcher surveys were completed on June 22 and July 7 in appropriate habitat with none found. For the analysis of effects, changes to suitable habitat were determined by using a spatial dataset of the existing habitat compared to expected changes induced by the project.



## Integrated Greenhorn Creek Restoration Project Cumulative Effects Analysis Area

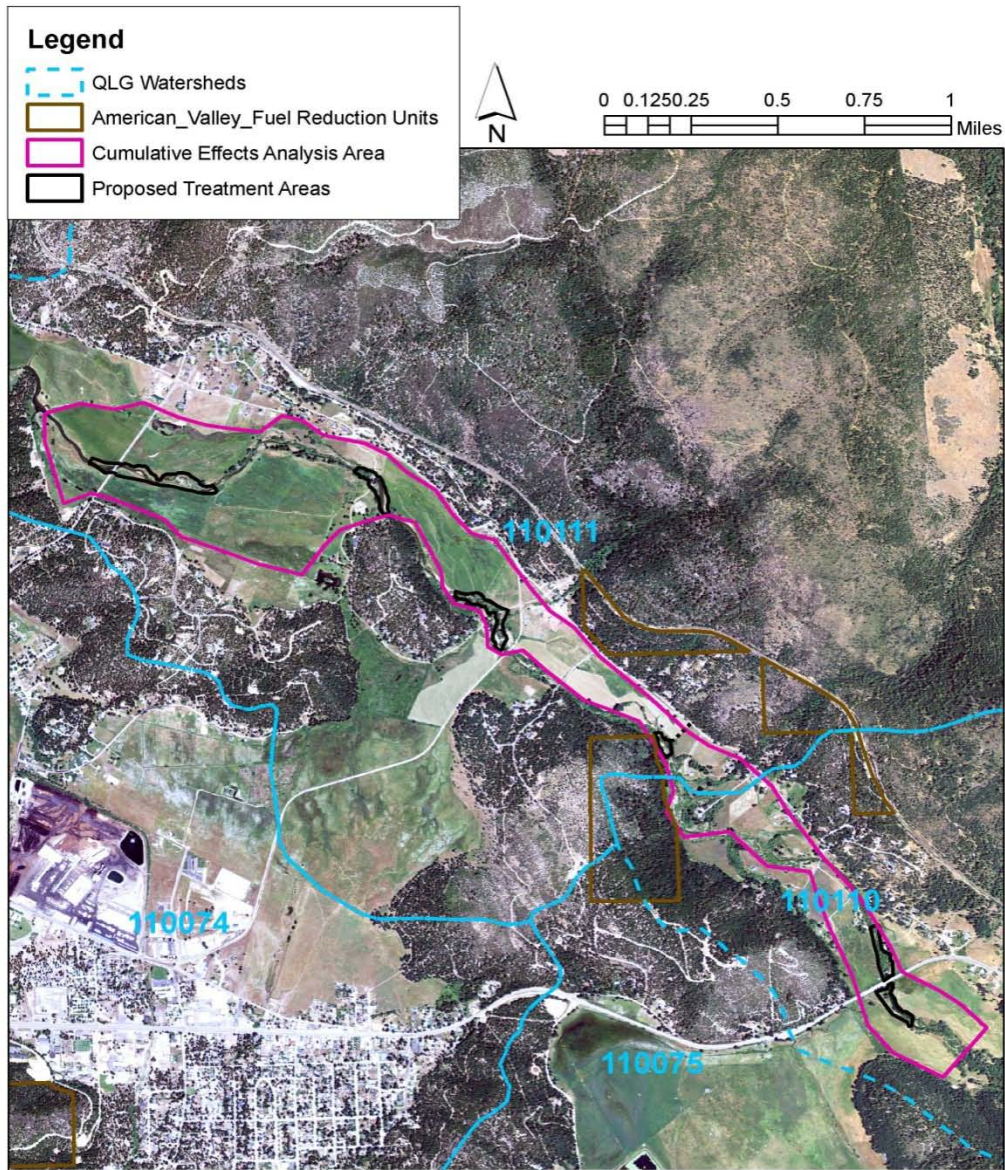


Figure 2. Wildlife Cumulative Effects Analysis Area.

## **AFFECTED ENVIRONMENT**

The following table displays existing habitat types in the Reid/PNF Treatment Unit, the other proposed Treatment Units on private land, and total wildlife cumulative effects analysis area.

**Table 2.Existing California Wildlife Habitat Relationships habitat type acreages in the project area and wildlife analysis area.**

<b>CWHR Habitat type</b>	<b>Reid/PNF Treatment Unit</b>	<b>All Treatment Units</b>	<b>Total Wildlife Analysis Area<sup>4</sup></b>
Riverine <sup>1</sup>	0.7	8.8	29.8
Montane Riparian <sup>2</sup>	0	1.5	17.6
Pasture <sup>3</sup>	0.5	11	316
Wet Meadow	0	0	32.8
Lacustrine	0	0	1.2
Non-wildlife habitat <sup>5</sup>	0	0	6.6
<b>TOTAL</b>	<b>1.2</b>	<b>21.3</b>	<b>404</b>

<sup>1</sup> acreage based ordinary high water mark

<sup>2</sup> acreage based on established vegetation within the gully bottom

<sup>3</sup> terrace above the gully bottom

<sup>4</sup> total includes project areas

<sup>5</sup> roads and buildings

### **Riverine Habitat**

Riverine habitat was identified as areas within the bottom of the gully within the ordinary high water mark. Backwater areas formed by irrigation dams on Greenhorn Creek were included in riverine habitat. Riverine channels within the analysis area have degraded to an average of seven feet below the elevation of the meadow. The entrenchment of the channel has resulted in diminished riverine habitat acres that are confined to the bottom of the gully. The current condition of excessive channel erosion from entrenchment widening and deepening, results in riverine habitat with excessive sedimentation and decreased bank vegetation. These characteristics translate to diminished quality of habitat for aquatic life, including macroinvertebrates that are an important food source for many species discussed below.

### **Lacustrine Habitat**

There is no lacustrine habitat within any treatment unit. There is one 1.2 acre farm pond within the wildlife cumulative effects analysis area that is located on private land. This habitat would not be affected by any treatment and will not be discussed further.

### **Montane Riparian Habitat**

In the existing degraded condition, montane riparian habitat is confined to the gully. CWHR montane riparian habitat has also been further restricted, due to the poor condition and early seral stage of riparian vegetation within the gully, resulting in no montane riparian habitat in the Reid/PNF Treatment Unit; only 1.5 acres in the other treatment polygons on private land; and 17.6 acres in the rest of the wildlife cumulative effects analysis area.



### **Wet Meadow Habitat**

Wet meadows are a function of channel/floodplain hydrology and soil types. Before the advent of intensive agricultural use along Greenhorn Creek, wet meadow was likely the predominant habitat type. Meadows within the analysis area were wetter before channel degradation. The entrenched channel throughout the length of the floodplain meadow of the analysis area has greatly altered the channel/floodplain hydrology, resulting in drier meadow conditions. In the existing condition, there are 32.8 acres of wet meadow habitat in the analysis area. The entrenched channel in the analysis area dries out the meadow by creating a drain at a lower elevation (creating more drainage pressure).

### **Pasture Habitats**

Channel degradation in the analysis area has contributed to some conversion of pre-degradational wet meadow habitat into drier habitats. The predominant land use in the wildlife analysis area is agriculture. All of the wildlife analysis area outside of the entrenchment is in this category (except areas of wet meadow, pond or non-habitat areas). In the existing condition, there are 316 acres of pasture habitat.

## **ENVIRONMENTAL CONSEQUENCES - GENERAL**

Table 3. California Wildlife Habitat Relationships habitat type acreages in the existing condition (No Action) compared to expected acreages under the Proposed Action.

<b>CWHR Habitat type</b>	<b>Reid/PNF Treatment Unit</b>		<b>All Treatment Units</b>		<b>Total Wildlife Analysis Area<sup>4</sup></b>	
	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
Riverine	0.7	0.7	8.8	8.8	29.8	29.8
Montane Riparian	0	0.1	1.5	1.8	17.6	17.9
Pasture	0.5	0.4	11	10.7	316	315.7
Wet Meadow	0	0	0	0	32.8	32.8
Lacustrine	0	0	0	0	1.2	1.2
Non-wildlife habitat	0	0	0	0	6.6	6.6
<b>TOTAL</b>	<b>1.2</b>	<b>1.2</b>	<b>21.3</b>	<b>21.3</b>	<b>404</b>	<b>404</b>

Implementation of the Proposed Action in the Reid/PNF Treatment Unit is expected to alter existing riverine and pasture habitat. Within the other treatment polygons, treatments would affect riverine, montane riparian and pasture habitat. Direct impacts to these habitats include: (1) temporarily routing channel flows from the existing channel into a bypass channel during construction; (2) increasing the percentage of pool (versus riffle) habitat; (3) increasing bank angle (from vertical to a 1:1 slope) so that vegetation can become established; (4) increasing riparian vegetation (sedges, willows, and alders where available) on the newly sloped banks; (5) slightly decreasing pasture habitat to improve the bank angle on

vertical banks; (6) improving water quality of riverine habitat by decreasing sedimentation from eroding banks.

Indirect effects to habitat would be due to disruption of the channel during construction, which would cause a temporary reduction (less than six months) in aquatic macro-invertebrates that are prey for amphibians, Pacific pond turtles, greater sandhill crane, willow flycatcher, pallid bat, Townsend's big-eared bat and western red bat.

### **Cumulative Effects**

In order to understand the contribution of past actions to the cumulative effects of the Proposed Action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the Proposed Action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions”.

The following table lists the past, current and reasonably foreseeable future actions that are considered in the cumulative impacts analysis for this project:

Table 4. Actions considered for cumulative effects in this analysis.

<b>Project</b>	<b>Date</b>	<b>Acreage</b>	<b>Comments</b>
<b>Past Activities</b>			
Bank stabilization	1991-2001	0.75 acres	Completed in 1991; maintenance in 2001 on 0.04 acres
<b>Present &amp; On-going Activities</b>			
Empire Sale*	2010-2012	1,031 acres group selection, 4,168 acres of mechanical thinning, 380 acres of hand thin/pile /burn, and 2.75 miles of road decommissioning	
Agricultural & residential housing land use around Greenhorn Creek	On-going	404 acres	Includes the valley
<b>Reasonably Foreseeable Future Activities</b>			
American Valley Fuels Reduction Project*	2011-2012	166 acres	
Five additional treatment units of the Integrated Greenhorn Creek Restoration Project	2012	19 acres	Includes bank stabilization and fish passage

\* Both of these projects are located at least partially in the Greenhorn Creek watershed, however, the implementation of Best Management Practices renders these timber management projects much less likely to measurably and cumulatively impact the Integrated Greenhorn Creek Restoration Project area than the other activities listed above. These two timber management activities will not be discussed further in this document.

Past bank stabilization work contributes to the existing condition and will not be discussed further in this document. Most of the cumulative effects of agriculture on habitat are due to historic manipulations rather than on-going uses. On-going agricultural land use in the analysis area includes irrigation, haying and livestock grazing. Cattle do not graze in most treatment unit boundaries, however, some grazing does occur on the Farnworth property, and some on the Reid property at the Shea Dam fish passage treatment. Grazing is excluded from the Reid/PNF Treatment Unit. Therefore, the Proposed Action in the Reid/PNF Treatment Unit would not affect, nor be affected by, on-going livestock grazing in the analysis area. Neither would the No Action Alternative affect, or be affected, by grazing. Haying and irrigation do not occur in the Reid/PNF Treatment Unit, and neither of these activities would be affected by either alternative.

On-going housing development along Greenhorn Creek is low-density. Housing would not be affected by either alternative. Housing contributes to the existing condition and will not be discussed further.

The Proposed Action on the Reid/PNF Treatment Unit is similar to work activities planned in five other treatment units on private land. There is a potential that construction in all six of these areas combined could affect water quality and aquatic life in Greenhorn Creek in the short term (less than 6 months). Potential cumulative effects from all proposed activities in the Integrated Greenhorn Creek Restoration Project include increased siltation during construction, and decreased aquatic macro-invertebrate production in the short term (less than 6 months). The following practices are included in the Proposed Action, and on all of the proposed treatment units to minimize these potential disturbances:

- routing stream flow around the work area, using a temporarily constructed bypass channel, and straw/plastic dams upstream and downstream of the work area
- pumping water that seeps into the work area out of the channel, and onto vegetated floodplain
- deployment of Sedimats® to capture settleable solids for removal from the channel onto bank areas. Once the work is completed, the straw/plastic dams would be removed, and the temporary bypass channel filled to original grade. Sedimats would be removed from the channel, and placed on streambanks where they would aid in stabilization.

In the long term, the expected reduction of sediment due to the Proposed Action and other treatments in the Integrated Greenhorn Creek Restoration Project is expected to benefit species that depend on macroinvertebrates as food. These benefits would also accrue to trout, and it should be noted that trout can prey upon subadult amphibians and tadpoles, as well as young turtles, thus cumulative impacts that enhance habitat for trout can degrade habitat for these species.

## **ENVIRONMENTAL CONSEQUENCES – SPECIES SPECIFIC EFFECTS**

As suggested by the Council on Environmental Quality (40 CFR 1508.28) this document is tiered to the programmatic Biological Assessment and Evaluation of Herger-Feinstein Quincy Library Group Forest Recovery Act (Rotta 1999) in order to restrict its length, and help both its preparer and readers focus on the site specific impacts of this project. Detailed life history descriptions, and discussions on the overall distributions, distributions within the pilot project area, conservation status of species, habitat requirements and life histories, can be found in (Rotta 1999). These topics will only be discussed briefly here as they apply to site-specific project effects.

### **Summary of Direct and Indirect Effects of the Proposed Action**

Overall direct effects that would occur as a result of the Integrated Greenhorn Creek Restoration project includes modification of the existing stream bed and bank morphology at six separate areas along Greenhorn Creek (see Figure 1). Bank stabilization as described in the Proposed Action in the Reid/PNF Treatment Unit, as well as proposed bank stabilization and fish passage in the five treatment areas on private land, may have an adverse direct effect on habitat in the short-term (less than six months), but are

expected to directly, indirectly, and cumulatively improve habitat in the long term (3-5 yrs) for the following US Forest Service sensitive species: Pacific pond turtle, greater sandhill crane, willow flycatcher, bald eagle, pallid bat, Townsend's big-eared bat, and western red bat. Project-specific surveys did not find any occurrence of these species.

Overall indirect effects on wildlife that could occur as a result of the project would be due to the temporary (less than six months) loss of aquatic macroinvertebrates, resulting from construction. This is an important food source for Pacific pond turtles, sandhill cranes, willow flycatchers and bats. However, only 1.3 miles to be treated of a total 3.9 miles, (or 33%) of the channel in the analysis area would be affected by construction over a period of at least two years. Therefore, in the wildlife analysis area, macroinvertebrate populations are not expected to temporarily decline to a level that would impair species that depend upon this food source. In the long term (3-5 years), the reduced sedimentation that is an expected result of the project would improve habitat for macroinvertebrates and the species that depend on them as a food source.

### **Summary of Cumulative Effects of the Proposed Action**

Table 4 describes activities considered in the cumulative effects analysis for the Integrated Greenhorn Creek Restoration Project. A cumulative watershed effects (CWE) analysis that was completed for the Empire fuel reduction project yielded 10.2% ERA (equivalent roaded acres), which is 85% of the Threshold of Concern (TOC) for the Greenhorn Creek watershed. Most (>75%) of the impacts however, are attributed to private land timber harvest. The Empire and American Valley projects are expected to produce long term benefits for soil productivity and watershed values by reducing the vulnerability of the project areas to high intensity wildfires that have adverse effects on these resources. These watershed benefits would be enhanced by the Proposed Action and other actions in the Integrated Greenhorn Creek Restoration Project that are expected to reduce sediment produced from eroding stream banks.

Cumulative effects to habitat in the analysis area due to agriculture are primarily due to historic manipulations rather than on-going uses. However, any cumulative effects to habitat due to agriculture would be reduced by implementation of the Proposed Action because eroding stream banks would be stabilized. Cumulative effects from other bank stabilization projects would be detrimentally additive in the short term, with increased short-term sedimentation during construction from implementation of all six treatment units, however, implementation of erosion and sedimentation control actions listed above would greatly reduce this impact. In the long term, treatments on private land would add to the reduction in sediment that would occur under the Proposed Action in the Reid/PNF treatment unit. It is expected that the treatment in all six units could result in a measurable reduction of sediment in Greenhorn Creek. It is doubtful that the reduction in sediment from just the Proposed Action in the Reid/PNF unit would be measurable.

### **Summary of Direct, Indirect, and Cumulative Effects of the No Action Alternative**

The No Action Alternative would result in no direct change in current conditions and trends within the analysis area. The opportunity to improve riparian and aquatic habitats for wildlife species will not occur at this time. Gullied stream banks will continue to erode, resulting in the continued loss in the quality and quantity of riparian and aquatic habitats. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from reasonably foreseeable treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

### **SIERRA NEVADA YELLOW-LEGGED FROG (SNYF) (*Rana sierrae*)**

SNYF is a candidate for federal listing. SNYF can be found in meadow streams, isolated pools, and lake borders, and prefer sloping banks with rocks or vegetation to the water's edge. They are usually not found more than 2-3 jumps from water (Stebbins 1985). Historically, *Rana sierrae* ranged "...from the Diamond Mountains north-east of the Sierra Nevada in Plumas County, California, south through the Sierra Nevada to the type locality, the southern-most locality (Inyo County). In the extreme north-west region of the Sierra Nevada, several populations occur just north of the Feather River, and to the east, there was a population on Mt Rose, north-east of Lake Tahoe in Washoe County, Nevada, but it is now extinct. West of the Sierra Nevada crest, the southern part of the *R. sierrae* range is bordered by ridges that divide the Middle and South Fork of the Kings River, ranging from Mather Pass to the Monarch Divide. East of the Sierra Nevada crest, *R. sierrae* occurs in the Glass Mountains just south of Mono Lake (Mono County) and along the east slope of the Sierra Nevada south to the type locality at Matlock Lake (Inyo County)." (Vredenburg, et al, 2007.) In 2008, the Society for the Study of Amphibians and Reptiles recognized two species, [\*Rana muscosa\*](#) - Southern Mountain Yellow-legged Frog and *Rana sierrae* - Sierra Nevada yellow-legged frog.

The nearest known population to the analysis area is seven stream miles west of the survey area in the Spanish Creek watershed. Streams east of the analysis area were surveyed in 2004 for the Empire project. No SNYF were found during that survey. Project-specific surveys in 2010 yielded no SNYF observations along Greenhorn Creek. Although habitat exists along the creek that could support SNYF, it is unlikely that this species occurs in the analysis area.

### **Direct, Indirect and Cumulative Effects of the Proposed Action and No Action**

Although habitat exists for this species in the project area, no individuals have been found, therefore it is very unlikely that there would be a direct, indirect, or cumulative impact to individuals. Habitat would directly be impacted by increased sediment and de-watering during construction. These actions could indirectly negatively impact SNYF habitat by temporarily reducing aquatic macroinvertebrates that SNYF prey upon. Macroinvertebrate populations, however, are expected to increase in the long term, as sediment from eroding banks is reduced by the project. The project's effects on macroinvertebrates would affect trout as well as amphibians (and all species that feed upon macroinvertebrates).

Greenhorn Creek is locally known as a productive trout fishery. Trout can also prey upon sub-adult frogs and tadpoles. The natural productivity of trout in Greenhorn Creek may be a natural limiting factor precluding the expansion of SNYF and other sensitive amphibian species into this waterway. Thus, since trout already occupy the habitat, and sensitive frogs do not, it is likely that the Proposed Action would continue to favor trout, and therefore have no indirect effect on SNYF or other sensitive amphibians.

Cumulatively, the project is expected to reduce some of the impacts of agriculture, enhance other soil and water protection actions in the watershed, and incrementally contribute to the benefits associated with bank stabilization and fish passage projects on private land in the Integrated Greenhorn Creek Restoration Project. These cumulative impacts are expected to benefit SNYF habitat by improving water quality and increasing stream bank vegetation. However, as discussed above, this would also improve conditions for trout, thus resulting in no cumulative effect on SNYF.

#### **Direct, Indirect and Cumulative Effects of No Action**

The No Action Alternative would result in no direct impacts due to construction. There would be no indirect effects due to a temporary reduction in macroinvertebrates. Current conditions and trends would remain the same within the analysis area. Gullied stream banks would continue to erode, resulting in a continued loss in the quality and quantity of riparian and aquatic habitats. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from reasonably foreseeable treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area, but because of the trout population, there is likely to be no effect on SNYF.

#### **Summary of Effects for Sierra Nevada Yellow-legged Frog**

Neither the Proposed Action nor the No Action alternative would affect individuals because there are none in, or closer than seven miles from, the project area. In the short term, habitat would be negatively directly affected by the Proposed Action from disturbance during construction, and indirectly negatively affected due to the potential loss of macroinvertebrates. In the long term, habitat would improve due to reduced sedimentation that would be expected to improve macroinvertebrate populations. However, this improvement, when considered in the presence of a trout population, and with the cumulative effects of other treatments in the proposed Integrated Greenhorn Creek Restoration Project would continue to favor trout as well. Since trout occur in project area, and SNYF do not, Proposed Action and cumulative effects from other activities are likely to continue to preclude SNYF from colonizing the project area, resulting in no effect to SNYF or their habitat.

#### **Determinations – Sierra Nevada yellow-legged frogs**

It is my determination that the Proposed Action would not affect the Sierra Nevada yellow-legged frog. It is my determination that the No Action alternative would not affect the Sierra Nevada yellow-legged frog.

### **FOOTHILL YELLOW-LEGGED FROG (FYLF) (*Rana boylei*)**

The FYLF is a Forest Service sensitive species. The elevational range of the FYLF extends from sea level to 6,370 ft. The frog is found in or near rocky streams in a variety of habitats including those found within the project area.

FYLF are known to occur along Spanish Creek in, and above American Valley, approximately six stream miles west of the analysis area. Streams east of the analysis area were surveyed in 2004 for the Empire project. No FYLF were found during that survey, nor were any found during project-specific surveys for the Integrated Greenhorn Creek Restoration Project in 2010.

### **Direct, Indirect and Cumulative Effects of the Proposed Action and No Action**

While the habitat for FYLF slightly differs from habitat preferences for the SNYF, direct, indirect, and cumulative effects to this species would be the same as the effects discussed above for the SNYF.

### **Determinations – Foothill yellow-legged frogs**

It is my determination that the Proposed Action would not affect the foothill yellow-legged frog.

It is my determination that the No Action alternative would not affect the foothill yellow-legged frog.

### **PACIFIC POND TURTLE (PPT) (*Actinemys marmorata marmorata*)**

A Forest Service sensitive species, this aquatic-oriented reptile was recently divided into two subspecies in northern and southern California. Plumas County populations fall into the northern subspecies which is *A. marmorata marmorata*. The species is found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, PPT prefers pools to shallower areas. Logs, rocks, cattail mats, or exposed banks are required for basking.

PPT are known to occur immediately adjacent to the analysis area in a ranch pond, as well as in at least one other pond within American Valley along Spanish Creek. PPT have also been documented occupying Greenhorn Creek near the Quincy Junction Road bridge (1991, 1993, 1995 Plumas NF database, Rotta personal observation). However, there were no sightings of PPT during project-specific surveys on Greenhorn Creek in 2010. Habitat exists for the species in the slower moving/pool areas of Greenhorn Creek within the analysis area, and within the treatment unit polygons.

### **Direct Effects of the Proposed Action**

Because of the proximity of known PPT to the analysis area, and suitable habitat within each of the treatment polygons, there is a potential for individuals to be negatively impacted in the short term during



construction via direct crushing from heavy equipment. This however, is unlikely because of the high degree of site fidelity displayed by these animals. Short term negative direct impacts to habitat include those discussed for the three amphibian species, i.e. temporarily increased sedimentation, and a temporarily de-watered channel bottom. Long term direct effects to habitat are expected to be beneficial: increased basking sites along the toe of the newly sloped bank and on the vane boulders. These beneficial impacts would occur immediately after construction and into the future.

**Mitigation** recommended to reduce negative short term direct impacts is to survey the project area for turtles prior to construction, to ensure that none are present and in danger of trampling from heavy equipment.

### **Indirect Effects of the Proposed Action**

Indirect effects to PPT are similar to indirect effects to amphibians, because macroinvertebrates are an important food source for PPT as well as amphibians. As with the discussions above for SNYF, and FYLF, the project is expected to have a short term negative indirect impact due to the loss of macroinvertebrates during construction. However, long term indirect impacts are expected to be beneficial, due to reduced sedimentation that should enhance habitat for macroinvertebrates, thus improving this food source for PPT.

### **Cumulative Effects of the Proposed Action**

Cumulative impacts to PPT are similar to those described above for amphibians, although to a somewhat lesser degree. Trout can prey upon young turtles, as they can upon amphibians, but are likely to favor amphibians over turtles.

### **Summary of Effects of the Proposed Action**

The Proposed Action is not expected to impact individuals, but may negatively affect PPT habitat in the short term, and improve habitat in the long term.

### **Direct, Indirect and Cumulative Impacts of No Action**

The No Action Alternative would result in no direct impacts due to construction. There would be no indirect effects due to a temporary reduction in macroinvertebrates. Current conditions and trends would remain the same within the analysis area. Gullied stream banks would continue to erode, resulting in a continued loss in the quality and quantity of riparian and aquatic habitat for the PPT. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from reasonably foreseeable treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

### **Determinations – Pacific Pond Turtle**

It is my determination that the Proposed Action may affect individuals but is not likely to result in a trend toward federal listing or loss of viability for the Pacific pond turtle.

It is my determination that the No Action alternative would not affect the Pacific pond turtle.

### **BALD EAGLE (*Haliaeetus leucocephalus*)**

The bald eagle is a Forest Service sensitive species. Bald eagles prefer habitats near seacoasts, rivers, large lakes, oceans, and other large bodies of open water with an abundance of fish. Studies have shown a preference for bodies of water with a circumference greater than 11 km (7 mi). Lakes with an area greater than 10 square kilometers (4 sq mi) are optimal for breeding bald eagles. This species requires old-growth and mature stands of trees for perching, roosting, and nesting. Selected trees must have good visibility, an open structure, and proximity to prey, but the height or species of tree is not as important as an abundance of comparatively large trees surrounding the body of water. Forests used for nesting should have a canopy cover of no more than 60 percent, and no less than 20 percent, and be in close proximity to water.

The nearest nesting territory is found approximately five miles west of the project area. There are no bodies of water large enough to meet the above territory/habitat needs that could support a bald eagle territory within the analysis area, but bald eagles have been observed within the analysis area, and it is possible that bald eagles use Greenhorn Creek within the analysis area for infrequent foraging. There is not nesting habitat within the analysis area.

### **Direct Effects of the Proposed Action**

Short term negative direct effects to bald eagle include potential disturbance to foraging due to noise and equipment movement during construction. This effect is likely to be minimal because the Proposed Action in the Reid/PNF Treatment Unit only occurs on 390 feet of stream channel, out of a total of 3.9 miles of stream channel in the analysis area. Construction would only occur during a maximum time period of two weeks. During construction there is ample area of stream channel available for foraging.

### **Indirect Effects of the Proposed Action**

Indirect effects to bald eagle would be long term beneficial effects, as the project is expected to improve conditions for trout, thus improving the food supply for bald eagle.

### **Cumulative Effects of the Proposed Action**

Intensive grazing can impact the wildlife value of riparian areas. For eagles, grazing in the analysis area likely contributes to a reduction of prey species. The Proposed Action is expected to improve riparian habitat by increasing streamside vegetation, thereby contributing to a cumulative benefit to bald eagles. Reasonably foreseeable fish passage and bank stabilization in the five other treatment units in the Integrated Greenhorn Creek Restoration Project would also cumulatively improve foraging habitat for bald eagles by improving habitat for trout, a preferred food item.

### **Summary of Effects of the Proposed Action**

Bald eagle may be minimally impacted during construction from heavy machinery, but are likely to benefit from the project in the long term from the expected increase in trout, on which they feed.

### **Direct, Indirect and Cumulative Impacts of No Action**

The No Action Alternative would result in no direct impacts due to construction. There would be no indirect effects of improved trout prey. Current conditions and trends would remain the same within the analysis area. Gullied stream banks would continue to erode, resulting in a continued loss in the quality and quantity of riparian and aquatic habitat, upon which bald eagle prey depend. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from reasonably foreseeable treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

### **Determinations – Bald Eagle**

It is my determination that the Proposed Action may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for the bald eagle.

It is my determination that the No Action alternative would not affect the bald eagle.

### **NORTHERN GOSHAWK (*Accipiter gentilis*)**

The northern goshawk is a Forest Service sensitive species. This species is a large, forest-dwelling raptor that inhabits the forests of northern coastal California and the northern Sierra Nevada. Its summer range extends into northern Alaska and throughout the northeastern United States. Northern goshawks depend on mature to old-growth forests for nesting and foraging, with high canopy closure and large trees (Greenwald et al. 2005). In the managed landscapes of northern California, habitat used by adult northern goshawks and their fledged juvenile offspring are characterized by patches of unmanaged or lightly harvested forest (Woodbridge et al. 1999). However, home-range and territories of northern goshawks can include mature and managed forests (Woodbridge et al. 1999), provided canopy cover, tree density, and down woody debris cover are high (Greenwald et al. 2005).

The closest goshawk Protected Activity Center (PAC) to the analysis area is three miles to the east.

Goshawks are not expected to be found in the analysis area, as it is comprised of open meadow/pasture and entrenched riparian habitats. There is a small hillside patch of mixed conifer forest to the west of the analysis area, however, there is no habitat that could support a viable goshawk territory within or near the analysis area.

### **Direct, Indirect and Cumulative Impacts of Proposed Action and No Action**

There is no nesting or foraging habitat for northern goshawk within the analysis area. The project would not affect any large diameter conifer or riparian deciduous trees, nor would it affect over-story structure. The project may affect the open nature of the understory by increasing willow stands, however, this is not expected to affect goshawk foraging, because willows would only expand within the existing entrenchment. Therefore, there would be no direct, indirect, or cumulative effects of either alternative on this species or its habitat.

#### **Determinations – Goshawk**

It is my determination that the Proposed Action would not affect the goshawk.

It is my determination that the No Action alternative would not affect the goshawk.

#### **CALIFORNIA SPOTTED OWL (*Strix occidentalis occidentalis*)**

The California Spotted Owl (CSO) is a Forest Service sensitive subspecies of spotted owl that inhabits coniferous and hardwood forests of the southern Cascades, western Sierra Nevada, and central and southern coastal mountains of California ([Verner et al. 1992](#)). The species distribution is linked with large, mature trees in late-seral stage forests with high canopy cover (Gutierrez et al. 1992).

The nearest PAC is three miles east of the project area in forested habitat. Spotted owls are not expected to be found in the analysis area, as it is comprised of open meadow/pasture and entrenched riparian habitats. There is a small hillside patch of mixed conifer forest to the west of the analysis area, however, there is no habitat that could support a viable spotted owl PAC within or near the analysis area.

#### **Direct, Indirect and Cumulative Impacts of Proposed Action and No Action**

There is no nesting or foraging habitat for spotted owls within the analysis area. No trees would be impacted by the project. Therefore, there would be no direct, indirect, or cumulative effects of either alternative on this species or its habitat.

#### **Determinations – Spotted Owl**

It is my determination that the Proposed Action would not affect the spotted owl.

It is my determination that the No Action alternative would not affect the spotted owl.

#### **GREAT GRAY OWL (GGO) (*Strix nebulosa*)**

The great gray owl (GGO) is a Forest Service sensitive species. It is a rare breeding bird in the United States south of Canada, and only isolated populations are known to occur in the lower 48 states, mainly west of the Rocky Mountains. These owls are thinly distributed through the Cascade Mountains of Washington and Oregon, with the exception of rather dense populations in the Blue Mountains of northeastern Oregon (*Bull and Henjum 1990*) and the mountains of Southwestern Oregon (*Fetz et al. 2000*). They are very rare in the Cascade/Siskiyou systems of California, with only a few historic records

known from Del Norte, Plumas, Shasta, and Siskiyou Counties. GGO were detected approximately 15 miles east of the analysis area near Lake Davis by the contractor in 2004-2008 with over 50 separate detections over that period. No project level surveys were conducted for the Integrated Greenhorn Creek Restoration Project, however, during protocol surveys for nearby forest management projects in recent years on the Mount Hough Ranger District (Empire, 2004-2005 and others in the 2000's), no GGO were detected.

### **Direct, Indirect and Cumulative Impacts of Proposed Action and No Action**

The open meadow and portions of ungrazed pasture within the analysis area provide some foraging habitat for this species. There is no nesting habitat for GGO within the analysis area. No trees would be impacted by the project. The project would not impact open meadow pasture habitat. Therefore, there would be no direct, indirect, or cumulative effects of either alternative on this species or its habitat.

### **Determinations – Great Gray Owl**

It is my determination that the Proposed Action would not affect the great gray owl.

It is my determination that the No Action alternative would not affect the great gray owl.

### **WILLOW FLYCATCHER (WIFL) (*Empidonax trailii brewsteri*)**

Willow flycatcher is a Forest Service sensitive species. It is one of the largest flycatchers in the genus *Empidonax*, and occurs in California in willow thickets with open grassy areas and open pooled water nearby, and occurs mostly in montane environments. The two closest known populations of willow flycatchers are approximately 12-15 miles south, and west, of the analysis area. Potentially suitable, but marginal, habitat occurs in the treatment units and analysis area of the Integrated Greenhorn Creek Restoration Project. Project-level protocol surveys were completed for WIFL in 2010 in the treatment units. No WIFLs were found.

### **Direct Effects of the Proposed Action**

Because of the presence of suitable habitat, it is possible that WIFL could occupy the Reid/PNF Treatment Unit, as well as any of the other treatment units, during the year of construction. To avoid direct impacts to individuals, **mitigation** should include either constructing the project outside of the Limited Operating Period (LOP), which is after August 31, or conducting protocol surveys for WIFL to determine presence and location prior to any disturbance if construction is planned to commence before August 31. If WIFL are detected, construction should either be delayed, or activities should be limited, so that a quarter mile buffer of no disturbance is maintained around the nest site. With this mitigation measure, there should be no direct impact to individuals, however it is possible that individuals could be missed in a survey.

Direct impacts to habitat would include disturbance to willows during construction. Selected willow plants would be uprooted with heavy equipment from the bank opposite of the treatment bank, and planted at the toe of sloped treatment bank. This use of vegetation has been shown in previous similar projects to improve riparian habitat, with excellent survival of transplanted plants. Thus, in the long term (3-5 years), the Proposed Action is expected to improve WIFL habitat by expanding willow habitat onto a bank that currently does not support vegetation.

### **Indirect Effects of the Proposed Action**

Because one of the primary food sources of WIFL is winged adult macroinvertebrates, there would be a temporary indirect negative impact to WIFL due to construction, and a long term beneficial effect. The effect of construction has been mentioned above for amphibians and turtles. This indirect effect is the same for any species for which macroinvertebrates are an important food source: a minimal temporary decrease in macroinvertebrates in the immediate work area due to de-watering and increased sedimentation, and a long term beneficial increase in macroinvertebrates due to decreased sedimentation.

### **Cumulative Effects of the Proposed Action**

The primary land use in the analysis area is grazing. Cowbird nest parasitism is known to negatively impact willow flycatcher reproduction. Grazing would continue to occur in the analysis area under either alternative, thus the Proposed Action would have no effect on this cumulative effect.

Reasonably foreseeable future bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct and indirect effects from the 1.2 acre, 390 foot channel treatment to a total of 21.3 acres, and 1.3 miles of stream channel treatment. Within the context of the entire 404 acre analysis area, this cumulative effect would be minimal in the short term, as construction would occur over at least two years, and only occur in five percent of the total analysis area, and 33% of the total channel miles. The proposed treatments in the Integrated Greenhorn Creek Restoration Project are expected to be cumulatively beneficial in the long term, with an expected measurable decrease in sedimentation from all of the proposed treatments.

### **Summary of Effects of the Proposed Action**

Mitigations described under direct effects would minimize potential direct negative effects to individuals. Long term direct effects on habitat would be beneficial. Short term indirect effects on macroinvertebrates would be negative, but long term impacts would be beneficial. Cumulative impacts from other actions in the Integrated Greenhorn Creek Restoration Project would expand the extent of short term negative and long term beneficial impacts. Short term cumulative impacts are expected to be minimal in the context of the analysis area. Long term cumulative impacts are expected to provide measurable improvements.

### **Direct, Indirect and Cumulative Effects of No Action**

The No Action Alternative would result in no direct or indirect impacts due to construction. Current conditions and trends would remain the same within the project area. The stream bank would continue to erode, resulting in a continued loss in the quality and quantity of riparian habitat, upon which WIFL depend. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

#### **Determinations – Willow Flycatcher**

It is my determination that the Proposed Action may affect individuals but is not likely to result in a trend toward federal listing or loss of viability for the willow flycatcher.

It is my determination that the No Action alternative would not affect the willow flycatcher.

#### **GREATER SANDHILL CRANE (*Grus canadensis tabida*)**

The greater sandhill crane is a Forest Service sensitive species. It is the largest of six subspecies of sandhill cranes that occur throughout North America. There are five recognized populations of greater sandhill cranes. The population that occurs in California is known as the Central Valley population. These birds winter in California's Central Valley, and nest in northeastern California, eastern Oregon, portions of Nevada and Washington, and British Columbia. Oregon and British Columbia support the majority of the nesting population and only a few pairs are found in Nevada and Washington. It is thought that 200-300 pairs nest in northeastern California. Recent estimates place the entire Central Valley population of greater sandhill cranes between 4,000 and 5,000 birds. Sandhill cranes utilize wet meadow, shallow lacustrine, and fresh emergent wetland habitats. Sandhill cranes are known to nest within the analysis area, however, they are not known to nest within any of the treatment units in the Integrated Greenhorn Creek Restoration Project.

#### **Direct Effects of the Proposed Action**

Nesting activities can occur from April to August. Sandhill cranes are sensitive to disturbance from human and grazing activity during nesting. To avoid direct impacts to individuals, **mitigation** should include either constructing the project outside of the Limited Operating Period (LOP), which is after August 1, or surveying for cranes to determine presence and location prior to any disturbance if construction is planned to commence before August 1. If cranes are detected, construction should either be delayed, or activities should be limited, so that a half mile buffer of no disturbance is maintained around the nest site. With this mitigation measure, there should be no direct impact to individuals, however, it is possible that individuals could be missed in a survey. Sandhill cranes have been observed in the analysis area in wet meadow areas away from the gullied main stem channel, where proposed activities would occur. It is not likely that cranes would use the wet areas within the confines of the gullied channel, therefore, there would be no direct effect on sandhill crane habitat due to the Proposed Action.

### **Indirect Effects of the Proposed Action**

Since sandhill cranes are not likely to use the gullied channel environs for foraging, it is unlikely that the Proposed Action would have an indirect effect on sandhill cranes.

### **Cumulative Effects of the Proposed Action**

While grazing can disturb nesting sandhill cranes, they are known to nest in the analysis area. Grazing land use in the analysis area helps to maintain the open meadow space preferred by sandhill cranes. Grazing would continue to occur in the analysis area under either alternative, thus the Proposed Action would have no effect on this cumulative effect.

As discussed under willow flycatchers, reasonably foreseeable bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct and indirect effects. A LOP would also be recommended for these treatments, thus minimizing this potential effect to individuals.

### **Summary of Effects of the Proposed Action**

A LOP would minimize potentially negative direct and cumulative effects to the sandhill crane from disturbance during construction. Since sandhill cranes do not use habitat near the confines of the gully, there would be no direct nor indirect effects on habitat.

### **Direct, Indirect, and Cumulative Effects of No Action**

The No Action Alternative would result in no direct or cumulative impacts due to construction. Sandhill cranes do not use the proposed action treatment area, nor other treatment areas in the Integrated Greenhorn Creek Restoration Project, thus No Action would not affect sandhill crane habitat. Cumulative effects due to grazing would remain the same under either alternative. Current conditions and trends would remain the same within the project area.

### **Determinations – Sandhill Crane**

It is my determination that the Proposed Action may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for the sandhill crane.

It is my determination that the No Action alternative would not affect the sandhill crane.

### **PALLID BAT (*Antrozous pallidus*), TOWNSEND'S BIG-EARED BAT (*Corynorhinus townsendii*), and WESTERN RED BAT (*Lasiurus blossevillii*)**

Pallid bat, Townsend's big-eared bat and western red bats are all Forest Service sensitive species. No project-specific surveys were conducted for bats. All three species are known to occur in Plumas County.



**Pallid bat** is a locally common species that most abundant below 6,000 feet in elevation, but have been recorded up to 10,000 feet in the Sierra Nevada (USDA Forest Service 2001). A wide variety of habitats is occupied, including grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests. The species is most common in open, dry habitats with rocky areas for roosting. Roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings. CNDDDB report of a mist-netted 12 individuals in summer, 2007. Surveys conducted by the Plumas National Forest during the past decade have found pallid bats near Portola, which is 25 miles east of the project area, and is dominated by pine and sagebrush habitat, most typical of this species' habitat preferences. There is no roosting habitat for this species in the analysis area.

**Townsend's big-eared bats** will use a variety of habitats, almost always near caves or other roosting areas. They can be found in pine forests and arid desert scrub habitats. When roosting they do not tuck themselves into cracks and crevices like many bat species do, but prefer large open areas. The closest known sighting of this species, in July 2007, was within one mile, west of the analysis area. There are abundant ponderosa pine forests surrounding the analysis area, but not within the analysis area.

**Western red bat** is a typical tree bat, which is closely associated with cottonwoods in riparian areas at elevations below 6,500 feet. Especially favored roosts are found where leaves form a dense canopy above and branches do not obstruct the bats' flyway below. Roosts are often in edge habitats adjacent to streams, fields, or urban areas. They appear to be highly associated with intact riparian habitat, particularly willows, cottonwoods, and sycamores (USDA Forest Service 2001). During winter, it migrates south where it hibernates. In California, it is mostly a summer visitor, ranging all over the state in various areas except the desert. Western red bats are known to occur 25 miles east of the project area in the mostly pine-dominated stands of eastern Plumas County, but none have been found in American Valley. There is marginal habitat for western red bat in the analysis area, with relatively few, small cottonwood trees, in an entrenched riparian area.

#### **Direct Effects of the Proposed Action on Pallid, Townsend's big-eared and Western red bats**

Because these bats can have a wide range, the Proposed Action has a potential for short-term, temporary disruption of riparian foraging, commuting, and roosting habitat for each of these species during construction due to heavy equipment noise and movement. However, this type of disturbance, (which occurs during daylight hours, when foraging is not occurring), is expected to be minimal. There would be no long term disturbance to potential roosts because trees would not be affected by the Proposed Action. The Proposed Action remains within the immediate area of the gullied stream channel.

#### **Indirect Effects of the Proposed Action on Pallid, Townsend's big-eared and Western red bats**

Adult winged macroinvertebrates are an important food source for these bat species. As discussed above for turtles, cranes, and willow flycatchers, any species that relies on this food source would be temporarily indirectly affected by a reduction in macroinvertebrates due to construction. This effect is

expected to be minimal due to adjacent areas that would not be affected by the Proposed Action. Bats can fly and have unusually large home ranges for their size and are able to utilize multiple habitat settings for different purposes. In the long term, bats would indirectly benefit from the Proposed Action because of the decreased sedimentation that would benefit macroinvertebrate populations.

#### **Cumulative Effects of the Proposed Action on Pallid, Townsend's big-eared and Western red bats**

The primary land use, grazing, does not appear to affect bats, thus there would be no cumulative effects from grazing.

As discussed under willow flycatchers, reasonably foreseeable bank stabilization and fish passage projects in the Integrated Greenhorn Creek Restoration Project would expand the areas of direct and indirect effects from the 1.2 acre, 390 foot channel Reid/PNF Treatment Unit to a total of 21.3 acres, and 1.3 miles of stream channel treatment. Within the context of the entire 404 acre analysis area, this cumulative effect would be minimal in the short term, as construction would occur over at least two years, and only occur in five percent of the total analysis area, and 33% of the total channel miles. The proposed treatments in the Integrated Greenhorn Creek Restoration Project are expected to be cumulatively beneficial in the long term, with an expected measurable decrease in sedimentation from all of the proposed treatments, thus improving macroinvertebrate populations on which bats feed.

#### **Direct, Indirect, and Cumulative Effects of No Action on Bats**

The No Action Alternative would result in no impacts due to construction. Current conditions and trends would remain the same within the project area. The stream bank would continue to erode, resulting in continued sedimentation that degrades habitat for macroinvertebrates, upon which bats feed. Cumulative effects from agriculture would remain the same under either alternative. Cumulative effects from treatments in the Integrated Greenhorn Creek Restoration Project would likely still contribute to a measurable improvement in habitat in the analysis area.

#### **Determinations – Bats**

It is my determination that the Proposed Action may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for the pallid bat, Townsend's big-eared bat, nor the western red bat.

It is my determination that the No Action alternative would not affect the pallid bat, Townsend's big-eared bat, nor the western red bat.

### **SUMMARY OF MITIGATION MEASURES**

- Limited Operating Period that prohibits activity until after August 31, unless a site-specific survey is conducted that determines absence or presence and location of nesting WIFLs.

- Limited Operating Period that prohibits activity until after August 1, unless a site-specific survey is conducted that determines absence or presence and location of nesting cranes.
- Survey construction area for turtles to avoid direct trampling of individuals by heavy equipment.
- To protect aquatic macroinvertebrates, which are an important food source for many species, take all necessary precautions to maintain water quality, and minimize turbidity during construction, including diverting water around work areas, employing dams and sedimats, and pumping seeping groundwater.

## **SUMMARY OF DETERMINATIONS**

Table 5. Comparison of the determinations of each alternative on Threatened, Endangered, Candidate, and Sensitive animal species that potentially occur on the PNF. WNA = Will Not Affect; MAI = May Affect Individuals, but is not likely to result in a trend toward Federal listing or loss of viability.

<b>Species</b>	<b>Alternative 1 (PA)</b>	<b>Alternative 2 (No-Action)</b>
<b>AMPHIBIANS</b>		
California red-legged frog ( <i>Rana draytonii</i> )	WNA	WNA
Foothill yellow-legged frog ( <i>Rana boylei</i> )	WNA	WNA
Sierra Nevada yellow-legged frog ( <i>Rana sierrae</i> )	WNA	WNA
<b>REPTILES</b>		
Pacific pond turtle ( <i>Actinemys marmorata marmorata</i> )	MAI	WNA
<b>BIRDS</b>		
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	MAI	WNA
Greater sandhill crane ( <i>Grus canadensis tabida</i> )	MAI	WNA
Great Gray Owl ( <i>Strix nebulosa</i> )	WNA	WNA
Spotted Owl ( <i>Strix occidentalis</i> )	WNA	WNA
Goshawk ( <i>Accipiter gentilis</i> )	WNA	WNA
Willow flycatcher ( <i>Empidonax trailii brewsteri</i> )	MAI	WNA
<b>MAMMALS</b>		
Pallid bat ( <i>Antrozous pallidus</i> )	MAI	WNA
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	MAI	WNA
Western red bat ( <i>Lasiurus blossevillii</i> )	MAI	WNA

## **Compliance with HFQLGFRA ROD and FEIS**

Areas of suitable habitat have been surveyed to protocols based on the best available science, to determine information relevant to implementation of site-specific resource management activities. This BA/BE has documented the species surveys that were conducted for this project, as well as the protocols that were implemented. Where appropriate, limited operating periods (LOPs) would be applied to unsurveyed habitat considered to be suitable for threatened, endangered, or sensitive species: and to habitat considered suitable for any species for which viability may be a concern. See Table 2.3, page 2-8 (HFQLGFRA FEIS) and pages A-54, A-60 – A-62 (SNFPA FSEIS 2004 ROD). If target species are found, LOPs would be implemented on a site-specific basis. As surveys are conducted, and no target species are found, LOPs can be lifted.

The ROD for the HFQLGFRA FEIS requires analysis of connectivity. Habitat would not be altered to the extent of disrupting existing connectivity for any species. Connectivity, including hydrologic connectivity, would be maintained to allow movement of old forest or aquatic/riparian-dependent species between areas of suitable habitat.

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## APPENDIX A

**U.S. Fish & Wildlife Service**  
**Sacramento Fish & Wildlife Office**  
**Federal Endangered and Threatened Species that Occur in**  
**or may be Affected by Projects in the**  
**Plumas National Forest**

Database last updated: April 29, 2010

Report Date: August 23, 2010

### Listed Species

*Branchinecta conservatio* - Conservancy fairy shrimp (E)  
*Desmocerus californicus dimorphus* - valley elderberry longhorn beetle (T)  
*Hypomesus transpacificus* - delta smelt (T)  
*Oncorhynchus* (=Salmo) *clarki henshawi* - Lahontan cutthroat trout (T)  
*Oncorhynchus mykiss* - Central Valley steelhead (T)  
*Oncorhynchus tshawytscha* - Central Valley spring-run chinook salmon (T)  
*Oncorhynchus tshawytscha* - winter-run chinook salmon, Sacramento River (E)  
*Orcuttia tenuis* - slender Orcutt grass (T)  
*Pseudocopaodes eunus obscurus* - Carson wandering skipper (E)  
*Rana draytonii* - California red-legged frog (T)  
*Senecio layneae* - Layne's butterweed (=ragwort) (T)

### Candidate Species

*Ivesia webberi* - Webber's ivesia (C)  
*Martes pennanti* - fisher (C)  
*Rana muscosa* - mountain yellow-legged frog (C)

### Species with Critical Habitat Proposed or Designated in this National Forest

California red-legged frog (PX)  
California red-legged frog (X)  
slender Orcutt grass (X)

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### Key:

(E) *Endangered* - Listed as being in danger of extinction.  
(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.  
(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.  
(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.  
*Critical Habitat* - Area essential to the conservation of a species.  
(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.  
(C) *Candidate* - Candidate to become a proposed species.  
(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.  
(X) *Critical Habitat* designated for this species

Greenhorn Creek (Hydrologic Unit Code #\_\_\_) is a HUC# tributary to Spanish Creek (HUC #---). Several watershed and landscape analyses have been conducted within the Spanish Creek watershed, including: the *East Branch North Fork Feather River: Spanish Creek and Last Chance Creek Non-Point Source Water Pollution Study* (1992); the *East Branch North Fork Feather River Erosion Control Strategy* (1994); and the *Landscape Analysis of Watersheds 23 & 24* (Mt Hough Ranger District 1997). Much of the watershed-wide information below is derived from these reports.

## **Affected Environment**

Greenhorn Creek is a 44,695 acre (70 mi<sup>2</sup>) watershed, with 45 inches of average annual precipitation. The 1994 study found that of the 273 miles of stream channel in the watershed, 153 miles are in fair to poor condition and in an eroding condition. Of those channel miles, 19 total miles are similar in slope and form to the reach through the analysis area; 13 of those miles (68%) are in an eroding condition.

In 1991, the FR-CRM undertook a stream and fish habitat restoration project on 0.75 miles of Greenhorn Creek within the analysis area. That work consisted of meander re-alignment using boulders, log revetments, and revegetation. High flows and sediment load in 1995 re-configured the channel once again, causing the abandonment of many of the structures. In 2001, boulder vanes were installed within a portion of the previously treated area above Highway 70. Boulder vanes have proven to be a successful technique when treating eroding banks that must remain within the confines of an existing entrenchment, and the boulder vanes continue to work as designed in the Farnworth polygon. (Proposed work associated with the Integrated Greenhorn Creek Restoration project would extend that vane treatment further downstream.)

The FR-CRM established a long-term monitoring reach, following the Stream Condition Inventory (SCI) protocol developed by Region Five of the US Forest Service. The reach is located just above the confluence of Greenhorn Creek with Spanish Creek. Geomorphic, water quality, and biological data were collected in 1999, 2001 & 2003. The following discussion is excerpted from the FR-CRM's 2003 Watershed Monitoring Report:

The site is located at the mouth of Greenhorn Creek, after it travels through American Valley. Geomorphic changes at this site include a barely perceptible increase in average bankfull width, and corresponding increasing width to depth ratio. Entrenchment, however, is remaining steady. The pool to riffle ratio and residual pool depth is also steadily increasing, and substrate particles decreasing in size, all of which point to some changes taking place that warrant continued monitoring. The slope was the same from 2001 to 2003, and perhaps the change from 1999 is due to a survey error (this is the first site that is surveyed each year). There was a general improvement in temperatures (i.e. cooling) from 2001 to 2003, as expected with the increased flows. Greenhorn temperatures are marginally good for trout, and this site was low in nutrients. No metal concentrations were particularly noteworthy. Bacteria could be a concern, with this site tied with the neighboring Spanish abv Greenhorn site for the 3<sup>rd</sup> highest concentration of fecal coliform in 2003. Random turbidity monitoring showed an expected increase in turbidity from just above American Valley to this site at the mouth. Fish productivity followed the flow trend, increasing in productivity from 2001 to 2003.



Average pooltail fines were 31, 33, and 6%, respectively in each of the three years. Pooltail fines below 10% are preferable for trout spawning, and the 2003 measurement shows a dramatic improvement. Measurements have not been taken since 2003, but are planned for 2011. More frequent storm-related turbidity sampling has occurred since 2002, involving numerous volunteers. Results from this anecdotal sampling effort indicate that average turbidity increases in Greenhorn Creek through American Valley by over 100%, as measured over a variety of flows. At approximate bankfull or higher flows, the average increase in turbidity is 150%.

Two storm-related in-depth water quality sampling efforts were conducted in spring 2010 along Greenhorn Creek from the upper crossing under Hwy 70, to the mouth. The purpose of the sampling was to try and identify potential water quality-related limiting factors for the trout population in Greenhorn Creek. Results of the sampling showed that Greenhorn Creek was within water quality standards, except for one high aluminum reading at the uppermost site. It was determined that the resources were not currently available to conduct a more thorough sampling effort (i.e. more sampling points, and more samples collected during more storm events), but it does appear that water quality from storm-generated run-off is not a limiting factor for trout production in Greenhorn Creek.

The Reid/PNF Treatment Unit encompasses 390 feet of stream bank along Greenhorn Creek. In 2007 and 2008, several landowners approached the FR-CRM with concerns over bank erosion. In response, the CRM contacted all of the landowners along Greenhorn Creek, who supported the development of a comprehensive plan to address bank erosion along the channel. The analysis area was determined, and the CRM sought and was awarded planning funds from Title III of the Secure Rural Schools and Self-Determination Act to assess the potential for restoration. The following is excerpted from the final report from that effort (Plumas Corporation 2009):

The segment of Greenhorn Creek running through American Valley provides irrigation water to six livestock and hay producers. Within the survey area there are three irrigation diversion dams along the channel, one at Highway 70, one mid-valley at the Shea Ranch, and one at the upper end of the Bresciani Ranch. There are also five road crossings. These dams and road crossings have, and continue to, exert considerable influence on channel dynamics. The channel has also been manipulated in several sections.

At present, the dams act to hold the bed at a pre-degradation elevation. However, while they have a significant stabilizing force on upstream segments of the channel, they are also now impassable to fish, due to the downcut streambed below each dam. All three dams are fairly old and the upper two are in danger of collapse. A dam collapse would cause major channel adjustment, with deposition below each dam, and head-cutting in the upstream direction. The elevation drop is 7.4 feet at Highway 70 and 9.0 feet at the Shea dam. The drop at the Bresciani dam is 1.5 feet.

The road crossings constrict high flows, creating backwater effects, which induce bedload deposition (bar formation) upstream. Consequently, bank erosion opposite of these developing bars accelerates as the gully widens to accommodate the developing meanders.

Historic channel straightening activities have contributed to the existing down-cut condition. Some of these straightened sections of channel now have some of the most locally stable banks along Greenhorn Creek. This temporary situation has led to the common, but erroneous, conclusion that straightening a channel leads to stability. In fact, most straightened channels eventually require stabilization work. In Greenhorn Creek, channel straightening has led to down-cutting, and attendant subsequent adjustments such as widening to accommodate the slope, bedload transport and floodplain that are all necessarily parts of what we call a “stream channel.

Relatively strong riparian vegetation and very cohesive soils have allowed many banks to re-vegetate since the last significant flood event. The recent drought has also allowed vegetation to propagate and thrive without the undo stress of frequent high flows. This stabilizing trend is likely to continue until the next big event. At that time, the recovery/revegetation process will be truncated as more bedload enters the system, and the gully widens at any weak point to accommodate both the bedload and the flood waters. Then the recovery/revegetation process would re-start.

Water temperatures were successfully measured in Greenhorn Creek above American Valley, at the Massack gage, and at the mouth of Greenhorn Creek, above its confluence with Spanish Creek in 2009. In general, water temperature increases approximately 9°F as Greenhorn Creek flows through American Valley. In 2009, there was a nine degree increase in daily average, daily maximum, and weekly average water temperatures. Diurnal fluctuation was approximately the same at both stations.

The warming of water traveling through American Valley can have an influence on trout production. At Massack, above the valley, zero days had an average temperature above 68°F, whereas 32 days at the confluence had an average temperature above 68°F. About 29% of the time in mid-May to the beginning of September, the temperature was above 68°F at the mouth. 68°F degrees is a significant temperature for trout, as temperatures above 68°F are not conducive for trout production. Short term temperatures above 75°F can be lethal. At Massack, there were 0 hours with temperatures above 68°F, and 3 hours with temperatures above 75°F at the mouth. Temperatures appear to be conducive for trout in some places through American Valley, and not in others. Continued monitoring should help narrow the sources of warming water temperatures through American Valley, however, lack of shade along sections of channel with eroding banks, and shallow areas associated with recently deposited gravel are likely sources of warming.

In 2007 and 2008, 39 channel and valley-wide cross-sections, and a longitudinal profile were topographically surveyed. Cross-section graphical displays and locations can be found in the report excerpted above. Cross-section Reid1 was located within the Reid/PNF Treatment Unit. Based on this cross-section, existing bankfull width is 56 feet, and bankfull area is 132 square feet. The slope in the project area is 0.4%. Compared to other cross-sections, it appears that the 320 foot wide gully at this location may be sufficient to accommodate flood flows. Active gully widening at this location is likely due to the aggrading gravel bar on the opposite bank.

The following table displays flow frequency estimations, based on calculations using the slope-area method, and least squares at Hwy 70, then extrapolated downstream to the project area, with a 152% greater watershed area.

Return Interval (yrs)	Estimated Flow (cfs)
1.5 (“bankfull”)	760
2	1,064
5	2,736
10	4,256
25	6,688
50	9,120
100	10,640

The existing condition in the project area is discernable in Figures – and – under the Description of the Alternatives.

## Environmental Effects

Environmental effects to water resources are discussed in terms of sedimentation, channel geometry, water temperatures, and fisheries.

### No Action – Direct and Indirect Effects

The No Action Alternative would maintain existing conditions. The primary source of sedimentation in the analysis area under current conditions is on-going erosion of the walls of the entrenched channel. This erosion also contributes excessive gravel to the system, resulting in gravel bar aggradation that leads to further widening of the entrenchment. As the entrenchment progresses deeper and wider, erosion is likely to continue until a resistant bed is reached, and an adequate floodplain width (that can accommodate flood flows and bedload) is reached at the new, lowered elevation. Depending on the reach, the stream channel in the analysis area is generally in good to poor condition with an unstable bed and unstable banks, contributing to accelerated channel erosion in some areas, and a trend toward stability in other areas.

Under this alternative, eroding banks would continue to slough off and remain in a vertical configuration. Vertical banks do not support vegetative colonization, and so temperature-moderating shade is unlikely to expand much under this alternative. Likewise, the gravel that is contributed to the channel from the eroding banks is likely to maintain unstable shallow areas that continue to absorb warming solar energy.

While gravels contributed to the channel from eroding banks can provide trout spawning substrate, the accompanying fine sediments may render those gravels unfit for successful spawning. Fine sediment measured at the mouth of Greenhorn Creek was approximately 30% in 1999 and 2001, and dropped to 6% in 2003. Fine sediments have not been measured in the project area. Based on the SCI data, it appears that under the No Action alternative, fine sediments would continue to be episodically generated as pieces of bank break off, become suspended in the stream flow, and eventually deposited in the stream bed. Cover for trout is an important habitat component, and is limited in the project area, with no overhanging bank or pool habitat.

**No Action – Cumulative Effects**

The project area is excluded from grazing, thus there would be no cumulative effect under either alternative from agriculture. Cumulative effects from other bank stabilization and fish passage activities would likely still occur. Cumulative effects to water resources under this alternative from other stabilization and fish passage activities could include increased short term sedimentation from construction, and a long term decrease in sedimentation from treated eroding banks; decreased water temperatures from decreased deposition and increased shade; and improved channel stability and fisheries.

**Proposed Action – Direct and Indirect Effects**

Potential hydrologic impacts of the Proposed Action include: sedimentation, water temperature, channel geometry, and fisheries. Sedimentation is expected to be reduced by the Proposed Action because the eroding gully walls would no longer contribute excessive sediment. The reduction of excessive sediment/bedload would also help stabilize channel geometry by not building gravel bars at the current rate. Water temperatures are expected to decrease over time as shade increases from vegetation that would be planted on sloped banks. Coldwater fisheries would improve as a result of reduced sediment, increased shade, pools formed by the vanes, and stabilized banks that can develop overhanging bank habitat.

**Proposed Action – Cumulative Effects**

Cumulative effects from agriculture are basically the same under this alternative as they are under the No Action alternative. The Proposed Action would increase the cumulative effects of the other fish passage and bank stabilization activities that are described under the No Action alternative, because the Proposed Action is a bank stabilization activity. It is unlikely that the Proposed Action, implemented by itself without the other five treatment units proposed in the Integrated Greenhorn Creek Restoration project, would produce measurable reductions in sedimentation/bedload, or water temperature in the analysis area. However, in combination with the other treatments, these parameters are likely to be measurably improved. Fishery improvements are likely to be measurable within the project area because of the pool habitat formed by the boulder vanes (i.e. fish are expected to occupy the pools), and the Proposed Action is expected to enhance cumulative effects on fisheries of other bank stabilization and fish passage projects.

**APPENDIX E****REFERENCES**

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## AFFECTED ENVIRONMENT

Greenhorn Creek and its environs through American Valley are geologically comprised of sedimentary and metasedimentary rocks, specifically, Quaternary alluvium and Paleozoic marine. Durrell (1987) describes American Valley as having once been a lake resulting from the damming of Spanish Creek. The dam was caused by movement of a fault located at the base of Grizzly Ridge between Spring Garden and Keddie. The valley lies in the Plumas Trench between the Sierra Nevada and Grizzly Ridge.

The basin is complexly faulted and must be composed of many fault-bounded blocks. The hills in the central part of the valley are the tops of high blocks that stood as islands in the lake. The outline of the basin, like that in Indian Valley is that of a drowned stream system with arms that extended up Spanish, Greenhorn, and Thompson creeks.

The orographic crest of the Sierra Nevada range is less than 10 air miles northeast of the project area, and defines the Greenhorn Creek watershed boundary. Average annual precipitation in the analysis area is 45 inches with 16 inches of run-off. The bulk of annual precipitation falls as snow from Pacific frontal systems during the winter (October- May) with a dry summer. Major watershed scale floods are the result of long duration, intense, rain-on-snow, storm events (1955, 1986, 1997).

The 1.2 acre project area is located at the bottom of a 42,226 acre watershed. Elevation in the watershed above the project area peaks at 7,779 feet. The elevation of the project area is approximately 3,500 feet. Along ridgetops and steep side slopes, boulders and rock outcrops dominate the landscape. The soil type within the project area is Greenhorn Series. The valley slope within the project area is 0.4%. Before degradation, the meadow surface was the floodplain of Greenhorn Creek, with overbanking flows occurring with a frequency somewhere between 2-10 years. The meadow was a moist to wet riparian area floodplain with stable soils, anchored by wet or mesic vegetation complexes with deep, dense root systems and excellent infiltration. In the current condition, the channel has degraded to an elevation eight feet below the meadow surface. Only the most infrequent flood flows can access the now-abandoned meadow floodplain. The north bank is characterized by a vertical slope, with on-going bank sloughing. Near the downstream end of the project area, a mid-channel bar is forming just beyond the base of the north bank. The south bank is characterized by a large, partially vegetated gravel bar. A new floodplain is forming at the lower elevation on the south side of the channel, and is characterized by overflow flood channels, riparian trees, shrubs, and a large gravel bar.

Systemic channel incision has severely impacted the functionality of the meadow floodplain and moisture characteristics of soils along Greenhorn Creek in the project area, as well as throughout the analysis area. Soil moisture is currently managed for agricultural productivity with irrigation.

## Soil Characteristics

The Soil Resource Inventory (USDA Forest Service, Plumas National Forest 1988) describes the soil type within the Reid/PNF Treatment Unit project area as Greenhorn Series, which consists of very deep, poorly drained soils on floodplains, formed in mixed alluvium weathered from predominately metasedimentary rocks and hydraulic mine tailings. Within the project area, soils stratify from the surface to 60 inches as loam, down to fine sand to loam, and to silt loam. In descriptions for water management for this soil, it is noted that cut banks can cave in.

Permeability of the soil is moderate. Available water capacity is high. Effective rooting depth is 20-30". Run-off is slow, and the hazard of water erosion is slight. A seasonal high water table is at a depth of 20-30" from December through May. This soil is subject to flooding in 3 out of 10 years for brief periods from December through March.

This unit is used for irrigated hay and pasture.

If this unit is used for hay and pasture, the main limitations are poor drainage and flooding. Wetness limits the choice of plants and the period of cutting or grazing. Flooding should be considered before any capital improvements are installed. The risk of flooding can be reduced by the use of levees. Irrigation water needs to be applied carefully to avoid raising the water table.

This soil is fair to poor for grain and seed crops, grasses and legumes, and good for wild herbaceous plants and wetland plants.

Table 2: Characteristics of soils within the analysis area (Soil Resource Inventory, USDA-Plumas NF, 1988).

<b>Soil Type</b> (and map unit number)	<b>% of analysis area</b>	<b>% of Reid/PNF unit</b>	<b>% of other treatment units</b>	<b>erosion factor (K*)</b>	<b>pH</b>
Greenhorn (23)	75%	100%	85%	0.32-0.43	6.1-7.3
Keddie (24)	17%	0	10%	0.32	6.1-7.3
Plumas (32)	5%	0	5%	0.15	6.1-7.3
Massack (30)	2%	0	0	0.32-0.37	6.1-7.3
Riverwash (36)	1%	0	0	Not analyzed	Not analyzed

\* K indicates the susceptibility of a soil to sheet and rill erosion by water, ranging from 0.05 to 0.69, the higher the K factor, the more the soil is susceptible to sheet and rill erosion by water.

The two other soils that would be impacted by proposed project activities associated with the Integrated Greenhorn Creek Restoration Project are the Keddie Series, and the Plumas Series. Since the Massack Series and Riverwash would not be impacted by project activities, they will not be discussed further. Similar to the Greenhorn Series, the Keddie Series also consists of very deep, poorly drained soils on floodplains and alluvial fans, formed in mixed alluvium. It consists of loam on top, stratified down to sandy loam to clay loam. The Plumas series consists of very deep, well-drained soils on alluvial fans, formed in mixed alluvium, predominately from metasedimentary rocks. It consists of very gravelly sandy loam on top, stratified down to extremely gravelly loamy sand. Similar to the Greenhorn series, both of these soils are fair to poor for grain and seed crops, grasses and legumes, and good for wild herbaceous plants and

wetland plants. As mentioned above, with the incision of the Greenhorn Creek channel, moisture characteristics of all of these soils has been altered so that flooding is less frequent, drainage is increased. Grasses are commonly grown by agriculturalists with the use of irrigation.

### **Soil Productivity**

Three criteria used for indicating the impacts of land management activities on soil productivity include the annual rate of soil loss, the porosity of the soil, and the maintenance of organic matter within the soil. Soil productivity is the inherent capacity of a soil resource to support appropriate site-specific biological resource management objectives, which includes the growth of specified plants, plant communities, or a sequence of plant communities to support multiple land uses (USDA Forest Service 2010). Invertebrate, microbial, and fungal populations comprise soil biota and are key to nutrient recycling and soil productivity.

### **Soil Productivity - Annual Rate of Soil Loss**

Within the project and analysis areas, the primary process for soil erosion is lateral gully wall migration that is associated with flowing water and excessive bedload deposition on gravel bars. Existing effective soil cover on meadows within the project area, as well as the entire analysis area is estimated at greater 70%, which is within PNF LRMP guidelines for effective soil cover.

Functional alluvial channel/floodplain systems are, by definition, net depositional landscape features. By serving as flood flow spreading and dispersal areas, water velocities of sediment-laden flows decrease, thus allowing sediments to deposit. Under the existing condition, with the incised channel, the depositional function is no longer occurring on the historic floodplain meadow feature. Streambanks are eroding at accelerated rates, resulting in transportation of those sediments downstream. The meadow floodplain is no longer accessible to spread flood flows and initiate deposition. In the absence of long-term site specific bank erosion studies (i.e. bank erosion pins), the typical methodology for calculating long-term bed-and-bank erosion rates of entrenched channels is to quantify the 'void' represented by the gully and extrapolate over a given time period. The following table summarizes gully and valley-wide cross-sections surveyed throughout the analysis area. It is generally accepted that most of the present entrenched channels have incised within the last 100 years. The net void (including gravel bar aggradation) within the project area is approximately 1,840 sq ft, multiplied by 390 feet of bank is 26,578 cubic yards, divided by 100 years is approximately 266 cubic yards per year.



Table XX. Channel and gully dimensions in the project area and analysis area. Reid 1 is the cross-section within the analysis area.

Cross-section	bankfull width (ft)	bankfull area (sq ft)	gully width (ft)	gully depth (ft)
frn1	57	93	100	6.1
frn2	79	198	98	5.55
0-A	41	127	196	10.62
1	45	117	165	11.13
1-a	21	44	90	10.5
Porter	46	139	130	9.4
blw Mill-Nick bridge	36	65	75	9.45
thon-miller	58	121	202	7.2
Lower Thon	87	231	178	6.2
DS of Thompson	40	77	166	5.7
ClIns-Jcby	48	66	342	4
Reid1	56	132	320	8.8
Reid2	76	142	353	9
Reid3	36	86	148	4.8
Reid4	38	65	245	5
Reid5	40	116	130	6.5
Reid6	40	52	100	5.8
UpValley	46	135	108	11.03
12	57	81	133	6.3
LoValley	38	96	71	6.6
Labbe	70	216	90	4.33
Span-Grnhn	43	126	75	4.56
Bresciani	30	39	61	7

### Soil Productivity - Porosity

Soil porosity is the volume of pores in a soil that can be occupied by air, gas or water. Porosity varies, depending on the size distribution of the particles and their arrangement with respect to each other. Soil compaction increases the bulk density and decreases the porosity of soils. Compaction can slow plant growth and impede root development. Soil compaction restricts percolation and can cause poor water infiltration, potentially resulting in increased overland flow during high precipitation events. Compaction increases soil strength, potentially causing vegetation to use more energy to access nutrients and water, resulting in a decline of above ground plant growth.

Results of the North American Long-Term Soil Productivity Study, summarized for study sites with at least 10 years of response, indicate that the effect of compaction on biomass productivity differs primarily depending upon the soil texture (Powers et al 2005). Reduced biomass productivity was observed for soils with high clay content. However, compacted sandy soils actually indicated increased biomass productivity. No significant change in biomass productivity was indicated for loamy soils. Loam is the primary texture of soils within the project area and analysis area, with little clay. Therefore, it is not likely that significant biomass productivity has been lost due to compaction under existing conditions in the project area or analysis area

### **Soil Productivity - Organic Matter and Soil Nutrients**

Organic matter is the cache for plant nutrients and is the primary source of plant-available nitrogen, phosphorus and sulfur. Organic material includes plant litter, duff, and woody material. Meadow sod and accumulated litter moderate soil temperature and moisture, providing an environment favorable for the soil biota that recycle plant and animal remains. Surface organic material also protects soils from erosion, and enhances infiltration and hydrologic function. Observations of soil cover greater than 70% within the project area and analysis area ensures that there is adequate organic matter and associated nutrients under existing conditions.

### **Buffering Capacity of the Soil**

Buffering capacity refers to the soil's ability to resist a significant change in pH, or acidity. The cation exchange capacity of soils gives them most of their buffering capacity. Typical pH levels for the soil types in the project area are listed in Table XX above. Acidity levels within the project and analysis area are relatively neutral, and are likely able to resist significant changes.

## **ENVIRONMENTAL EFFECTS**

### **Annual Rate of Soil Loss**

#### **No Action Alternative**

Direct effects are not applicable to the No-Action Alternative. Indirectly, this alternative would likely maintain the existing soil loss rate of 266 cubic yards per year until an adequate floodplain area is eroded away at the lowered elevation. Cumulative effects from livestock grazing would not affect soil loss under either alternative, since there is no livestock grazing in the project area. Cumulative effects to soil loss from other bank stabilization and fish passage projects proposed within the analysis area are not likely to affect soil loss within the project area.

#### **Proposed Action**

**Direct and Indirect Effects:** Potential loss of soil during construction minor because best management practices would be employed to protect soil and water resources. The primary practices to protect soil and water resources include diverting water around the work area, pumping water that subsurfaces into the work area onto vegetated floodplain, employing sediments below the work area, and vegetating, seeding, and mulching the newly sloped bank and other disturbed areas. The express purpose of the proposed bank treatment is to directly reduce soil loss due to bank erosion within the project area. This would be accomplished by laying back and vegetating the bank, and installing boulder vanes to direct flow vectors away from the bank and into the center of the channel. The boulder vanes would help direct energy of flowing water into maintaining vertical pool depth rather than lateral bank erosion.

**Cumulative Effects:** As mentioned above, cumulative effects from livestock grazing would not occur under either alternative. Cumulative effects to soil loss from other bank stabilization and fish passage projects would be enhanced under the Proposed Action, because soil loss would also be reduced in those areas.

## **Porosity**

### **No Action Alternative**

Direct effects are not applicable to the No-Action Alternative. Because of the high loam and low clay content of the soil, soil porosity is not easily diminished in the project area or analysis area. Soil porosity is likely to remain the same under either alternative. Neither grazing nor irrigation would not affect soil porosity since these activities do not occur within the project area. Other bank stabilization and fish passage projects could affect soil porosity within the analysis area, by expanding the effects discussed below under the Proposed Action. However, compaction is a localized effect, and compaction from activities in other areas would not affect compaction in the project area.

### **Proposed Action**

**Direct and Indirect Effects:** The Proposed Action would use heavy equipment to move soil to lay back the bank and re-contour the gravel bar. There is a potential for heavy equipment to directly impact soil porosity by increasing compaction. However, heavy equipment with tracks would be used, which have less weight per square inch than wheeled vehicles, thereby minimizing the potential for compaction. Also, construction would occur during the dry time of year, and irrigation does not affect the project area (since the project area is not grazed, it is not irrigated). Soil compaction is mostly a concern at moderate moisture levels. The dry nature of the soils in late summer or early fall, when the project area would be constructed, would not lead to compaction due to heavy equipment. Heavy equipment travel on the terraced floodplain would be minimized in order to minimize compaction. Neither bank sloping nor gravel bar re-contouring would affect soil porosity in the long term, as the soil structures would likely remain the same.

**Cumulative Effects:** Grazing and irrigation are not likely to cumulatively impact porosity, since they do not occur in the project area. Other bank stabilization and fish passage structure proposals have the potential to expand direct compaction effects, due to construction, however, these effects are expected to be minimal due to timing of construction, and the distribution of weight on tracked equipment, as just discussed under Direct and Indirect Effects.

## **Organic Matter and Nutrients**

### **No Action Alternative**

Direct effects are not applicable to the No-Action Alternative. Under this alternative, no bank stabilization would occur. Existing nutrient levels and organic matter in the project area would remain. Cumulative effects from agriculture would not affect nutrients and organic matter, since there is no grazing in the project area. Soil nutrients and organic matter are localized soil properties. Cumulative effects from other bank stabilization and fish passage projects would not affect nutrients and organic matter in the project area.

### **Proposed Action**

**Direct and Indirect Effects:** Under the Proposed Action, organic matter and soil nutrients may be temporarily decreased during construction. However, project activities would be controlled by

Best Management Practices (BMPs), and soil disturbance outside of the sloped bank and gravel bar would be minimal. All disturbed areas would be seeded with native seed and mulched with weed-free mulch after construction. The mulch will replenish organic matter that may have been lost due to construction. Project BMPs also require that equipment access routes and staging areas not be mechanically cleared in order to retain the majority of organic matter and nutrients in place. Topsoil on the top of the bank to be sloped would be removed, stock-piled, and spread on the sloped bank in order to retain organic matter and nutrients.

**Cumulative Effects:** There would be no cumulative effects from agriculture since there is no grazing nor irrigation in the project area. Cumulative effects from proposed bank stabilization and fish passage projects would expand the effects discussed above under Direct and Indirect Effects to 21 acres within the analysis area. These effects would remain within each treatment area, and would be minimized using the Best Management Practices discussed above under Direct and Indirect Effects. The Proposed Action would not affect organic matter and nutrients in these other areas, nor would work in those areas affect organic matter and nutrients in the project area.

### **Buffering Capacity**

**Direct, Indirect, and Cumulative Effects for Both Alternatives:** No materials would be added to the soil under either alternative that would alter the reaction class, buffering or exchange capacity. There would be no change in the trend of buffering capacity from existing conditions under either alternative.

## **REFERENCES**

Durrell, C. 1994. Geologic History of the Feather River Country. University of California Press.

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Ritter, D.F., Kochel, R.C., Miller, J.R. 1995. Process Geomorphology, 3<sup>rd</sup> Edition, W.C. M. Brown

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# U.S. Army Corps of Engineers South Pacific Division



## Nationwide Permit Pre-Construction Notification (PCN) Form

This form integrates requirements of the Nationwide Permit Program within SPD, including General and Regional Conditions. Please consult instructions prior to completing this form.

<b>Box 1 Project Name</b> <b>Integrated Greenhorn Creek Restoration Project</b>			
<b>Applicant Name</b> <b>Leslie Mink</b>		<b>Applicant Title</b> <b>Project Manager</b>	
<b>Applicant Company, Agency, etc.</b> <b>Feather River Coordinated Resource Management - Plumas Corporation</b>		Applicant's internal tracking number (if any)	
Mailing Address PO Box 3880			
Work Phone with area code 530-283-3739	Home Phone with area code 530-283-0137	Fax # with area code 530-283-5465	E-mail Address leslie@plumascounty.org
Relationship of applicant to property: <input type="checkbox"/> Owner <input type="checkbox"/> Purchaser <input type="checkbox"/> Lessee <input checked="" type="checkbox"/> Other: Project Proponent			
Application is hereby made for verification that subject regulated activities associated with subject project qualify for authorization under a Corps nationwide permit or permits as described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities. I hereby grant to the agency to which this application is made, the right to enter the above-described location to inspect the proposed, in-progress or completed work. I agree to start work <u>only</u> after all necessary permits have been received.			
<b>Signature of applicant</b>			Date (m/d/yyyy)

<b>Box 2 Authorized Agent/Operator Name</b> <i>(If an agent is acting for the applicant during the permit process)</i>			
<b>Agent/Operator Title</b>		<b>Agent/Operator Company, Agency, etc.</b>	
Mailing Address			
Work Phone with area code	Home Phone with area code	Fax # with area code	E-mail Address
I hereby authorize the above named authorized agent to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application. I understand that I am bound by the actions of my agent and I understand that if a federal or state permit is issued, I, or my agent, must sign the permit.			
<b>Signature of applicant</b>			Date (m/d/yyyy)
I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete, and accurate.			
<b>Signature of authorized agent</b>			Date (m/d/yyyy)



<b>Box 3 Name of Property Owner(s), if other than Applicant:</b> SEE ATTACHED PROPERTY OWNER LIST	
<b>Owner Title</b>	<b>Owner Company, Agency, etc.</b>
Mailing Address	
Work Phone with area code	Home Phone with area code

<b>Box 4 Name of Contractor(s) (if known):</b> NOT KNOWN AT THIS TIME	
<b>Contractor Title</b>	<b>Contractor Company, Agency, etc.</b>
Mailing Address	
Work Phone with area code	Home Phone with area code

<b>Box 5 Site Number <u>1</u> of <u>1</u>. Project location(s), including street address, city, county, state, zip code where proposed activity will occur:</b> ON GREENHORN CREEK IN AMERICAN VALLEY, ALONG CHANDLER ROAD AND HIGHWAY 70; IN PLUMAS COUNTY, CALIFORNIA; NEAR THE TOWN OF QUINCY 95971	
<b>Waterbody</b> (if known, otherwise enter "an unnamed tributary to"): <b>Greenhorn Creek</b>	
Tributary to what known, downstream waterbody: Spanish Creek	
Latitude & Longitude (D/M/S, DD, or UTM): 39.95 & -120.883	Zoning Designation (no codes or abbreviations): General Agriculture, Floodplain, Secondary Suburban, Special Plan - Scenic Area, Special Plan - Scenic Road, Mobile Home Combining Zone
Assessors Parcel Number: 117160030, 005460008, 005290032, 117210017, 117070037, 117120013, 117120012, 005290043	Section, Township, Range: T24N R10E Secs. 7, 8, 16, 17, 21
USGS Quadrangle map name: Quincy; Spring Garden	
Watershed and other location descriptions, if known: Greenhorn Creek; trib to Spanish Creek (HUC 5 #1802012207)	

Directions to the project location:

From State Hwy 70 east of Quincy, turn N on Chandler Road. See project location map for where treatment sites are located along Chandler Road.

**Nature of Activity** (Description of project, include all features, see instructions):

PROJECT PURPOSE IS TO STABILIZE STREAMBANKS USING BOULDERS AND BANK SLOPING, AND RESTORE FISH PASSAGE BY RAISING THE STREAMBED WITH TWO RIFFLE-POOL STRUCTURES. PROJECT WORK WOULD ENTAIL WORKING WITH HEAVY EQUIPMENT IN THE STREAM CHANNEL. MITIGATIONS INCLUDE TEMPORARILY CHANNELING STREAM FLOW AROUND THE WORK AREAS. SEE PROJECT DESCRIPTION, INCLUDING SUMMARY OF MITIGATIONS IN ATTACHED CEQA INITIAL STUDY.

**Project Purpose** (Description the reason or purpose of the project, see instructions):

STABILIZE ERODING STREAMBANKS AND STREAMBED, AND RESTORE FISH PASSAGE



Use Box 6 if dredged and/or fill material is to be discharged:

**Box 6 Reason(s) for Discharge into waters of the United States:**

TO STABILIZE EXISTING ERODING STREAMBANKS, STABILIZE ERODING STREAMBED AT THE CAROL LANCE EAST BRIDGE, AND RESTORE FISH PASSAGE AT TWO IRRIGATION DAMS THAT HAVE BECOME BARRIERS TO FISH PASSAGE AS THE CHANNEL HAS BECOME MORE INCISED SINCE THE 1950'S.

Type(s) of material being discharged and the amount of each type in cubic yards:

585 cu yds of 3-4 ft boulders; 6,300 cu yds of 3-ft-minus pit run type material; 120 cu yds of native bank material would be moved to slope the streambanks; 40 cu yds of material would be moved from existing gravel bars to create a floodplain bench at the base of sloped banks.

Total surface area in acres of wetlands or other waters of the U.S. filled (see instructions):

Based on a 3' wide floodplain bench at the bottom of 1,533 linear feet of bank sloping, and 39 vanes (70' longx3' wide), 0.3 acres of waters of the US would be filled for bank & bed stabilization (unveg). Fish passage at Shea Dam is 350' long x 108' gully width (35' unveg) = 0.9 ac. Fish passage at Scoppwer is 333' long x 90' gully width (35' unveg) = 0.7 ac. Total of 1.9 acres filled. 3' wide excavator bucket on 3,808' of temporary bypass channel = 0.3 ac.

Project construction would utilize an excavator, dump trucks, and water truck.

None of the proposed work has been completed.

Indicate in ACRES and LINEAR FEET (where appropriate) the proposed impacts to **waters of the United States**, and identify the impact(s) as permanent and/or temporary for each water body type listed below:

Water Body Type	Permanent		Temporary	
	Acres	Linear feet	Acres	Linear feet
Wetland				
Riparian streambed	1.1	683	0.3	3,808
Unveg. streambed	0.8	2,216		
Lake				
Ocean				
Other				
Total:	1.9	2,589	0.3	3,808

Potential indirect and/or cumulative impacts of proposed discharge (if any):

By reducing streambank and bed erosion, indirect and cumulative benefits to the channel system include improved water quality from less sedimentation from eroding banks, improved fish habitat due to cleaner water and pools created by the boulder vanes, and improved riparian vegetation due to sloped and planted banks. Restoring fish passage is expected to indirectly and cumulatively benefit trout by allowing access to upstream spawning areas.

Required drawings (see instructions):

Vicinity map: ☒ Attached (or mail copy separately if applying electronically)

To-scale Plan view drawing(s): ☒ Attached (or mail copy separately if applying electronically)

To-scale elevation and/or Cross Section drawing(s): ☒ Attached (or mail copy separately if applying electronically)

Has a wetlands/waters of the U.S. delineation been completed?

☒ Yes, Attached (or mail copy separately if applying electronically) ☐ No

If a delineation has been completed, has it been verified in writing by the Corps?

☐ Yes, Date of approved jurisdictional determination (m/d/yyyy): Corps file number: ☒ No

Please attach<sup>1</sup> one or more color photographs of the existing conditions (aerials if possible).

<sup>1</sup>or mail copy separately if applying electronically

Dredge Volume: Indicate in CUBIC YARDS the quantity of material to be dredged or used as fill: No dredge. See box 6 line 2.

Indicate type(s) of material proposed to be discharged in waters of the United States:  
See box 6 line 2.

For proposed discharges of dredged material into waters of the U.S. (including beach nourishment), please attach<sup>2</sup> a proposed Sampling and Analysis Plan (SAP) prepared according to Inland Testing Manual (ITM) guidelines (including Tier I information, if available).

<sup>2</sup>or mail copy separately if applying electronically

Is any portion of the work already complete? ☐ YES ☒ NO

If yes, describe the work:

**Box 7 Intended NWP number (1<sup>st</sup>)<sup>3</sup>:** 27

**Intended NWP number (2<sup>nd</sup>):**

**Intended NWP number (3<sup>rd</sup>):**

<sup>3</sup>Enter the intended permit type(s). See NWP regulations for permit types and qualification information ([http://www.usace.army.mil/inet/functions/cw/cecwo/reg/nationwide\\_permits.htm](http://www.usace.army.mil/inet/functions/cw/cecwo/reg/nationwide_permits.htm)).

**Box 8 Authority:**

Is Section 10 of the Rivers and Harbors Act applicable?: ☐ YES ☒ NO

Is Section 404 of the Clean Water Act applicable?: ☒ YES ☐ NO

**Box 9** Is the discharge of fill or dredged material for which Section 10/404 authorization is sought part of a larger plan of development?: ☐ YES ☒ NO

If discharge of fill or dredged material is part of development, name and proposed schedule for that larger development (start-up, duration, and completion dates):

Location of larger development (If discharge of fill or dredged material is part of a plan of development, a map of suitable quality and detail of the entire project site should be included):

Total area in acres of entire project area (including larger plan of development, where applicable):

**Box 10 Threatened or Endangered Species**

Please list any federally-listed (or proposed) threatened or endangered species or critical habitat within the project area (use scientific names (e.g., Genus species), if known):

- a. no T or E species  
c.  
e.
- b. or habitat  
d.  
f.

Have surveys, using U.S. Fish and Wildlife Service/NOAA Fisheries protocols, been conducted?

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

If a federally-listed species would be impacted, please provide a description and a biological evaluation.

☐ Yes, Report attached (or mail copy separately if applying electronically) ☐ Not attached

Has the USFWS/NOAA Fisheries issued a Biological Opinion?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

If yes, list date Opinion was issued (m/d/yyyy):

Has Section 7 consultation been initiated by another federal agency?

☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

Has Section 10 consultation been initiated for the proposed project?

☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

**Box 11 Historic properties and cultural resources:**

Please list any historic properties listed (or eligible to be listed) on the National Register of Historic Places:

- a. none.  
c.  
e.
- b.  
d.  
f.

Are any cultural resources of any type known to exist on-site?

☒ Yes ☐ No

Has an archaeological records search been conducted?

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

Has a archaeological pedestrian survey been conducted for the site?

☒ Yes, Report attached (or mail copy separately if applying electronically) ☐ No

Has a Section 106 MOA been signed by another federal agency and the SHPO?

☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

If yes, list date MOA was signed (m/d/yyyy):

Has Section 106 consultation been initiated by another federal agency?

☐ Yes, Initiation letter attached (or mail copy separately if applying electronically) ☒ No

**Box 12 Measures taken to avoid and minimize impacts to waters of the United States (if any):**

Please see the Summary of Mitigation Measures at the end of the project description in the attached CEQA Initial Study. Measures include: Construction during the low flow period; water diverted around the work areas, pumping additional water out of the work area onto vegetated floodplain, using Sedimats® to capture sediment, minimizing project footprint, minimizing disturbance to riparian vegetation, revegetating and mulching disturbed areas, servicing and re-fueling equipment outside of the riparian zone, and collecting water quality samples.

Include multiple copies of Box 13 for separate sites.

**Box 13 Proposed Compensatory Mitigation** (site \_ of \_\_) related to fill/excavation and dredge activities. Indicate in ACRES and LINEAR FEET (where appropriate) the total quantity of waters of the United States proposed to be created, restored, enhanced and/or preserved for purposes of providing compensatory mitigation. Indicate water body type (wetland, riparian streambed, unvegetated streambed, lake, ocean, other) or non-jurisdictional (uplands<sup>5</sup>). Indicate mitigation type (on- or off-site by applicant, mitigation bank, in-lieu fee program):

Water Body Type	Created	Restored	Enhanced	Preserved	Mitigation type
			-	-	
	-	-		-	
Totals:					

<sup>5</sup> For uplands, please indicate if designed as an upland buffer.

If no mitigation is proposed, provide detailed explanation of why no mitigation would be necessary: Project will stabilize eroding stream bank and bed, and provide fish passage. Project would result in enhanced aquatic and riparian habitats.

Has a draft/conceptual mitigation plan been prepared in accordance with the Army Corps of Engineers District guidelines? ☐ Yes, Attached (or mail copy separately if applying electronically) ☒ No

Mitigation site Latitude & Longitude (D/M/S, DD, or UTM):

USGS Quadrangle map name:

Assessors Parcel Number:

Section, Township, Range:

Other location descriptions, if known:
Directions to the mitigation location:

**Box 14 Water Quality Certification** (see instructions):Applying for certification? ☒ Yes, Attached (or mail copy separately if applying electronically) ☐ NoCertification issued? ☐ Yes, Attached (or mail copy separately if applying electronically) ☒ NoExempt? ☐ Yes ☒ NoIf exempt, state why: Agency concurrence? ☐ Yes, Attached ☐ No**Box 15 Coastal Zone Management Act** (see instructions):Is the project located within the Coastal Zone? ☐ Yes ☒ No

If yes, applying for a coastal commission-approved Coastal Development Permit?

☐ Yes, Attached (or mail copy separately if applying electronically) ☐ No

If no, applying for separate CZMA-consistency certification?

☐ Yes, Attached (or mail copy separately if applying electronically) ☐ NoPermit/Consistency issued? ☐ Yes, Attached (or mail copy separately if applying electronically) ☐ NoExempt? ☐ Yes ☐ No

If exempt, state why:

**Box 16** List of other certifications or approvals/denials received from other federal, state, or local agencies for work described in this application:

Agency	Type Approval <sup>4</sup>	Identification No.	Date Applied	Date Approved	Date Denied
Plumas County	CEQA Mit. Neg Dec & Grading Permit		6/8/11		
RWQCB	401 WQ Certification		6/10/11		
Calif Dept Fish & Game			6/10/11		

<sup>4</sup> Would include but is not restricted to zoning, building, and flood plain permits

## NWP General Conditions (GC) checklist:

### 1. Navigation:

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: project would not affect navigation

### 2. Aquatic Life Movements:

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: fish passage would be restored through project area where none now exists due to erosion below irrigation dams

### 3. Spawning Areas:

Spawning areas present? ☒ Yes ☐ No

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: No important spawning areas present. Project construction activities would occur outside of native trout spawning season. Limited and marginal spawning areas will be enhanced by eliminating source of sedimentation.

### 4. Migratory Bird Breeding Areas:

Migratory bird breeding areas present? ☒ Yes ☐ No

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: Very few birds breed in project area. Activities would be outside of breeding season.

### 5. Shellfish Beds:

Shellfish beds present? ☐ Yes ☒ No

Project would be in compliance with GC? ☐ Yes ☐ No

Explain:

### 6. Suitable Material:

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: Project would use native bank material existing at site and local pit run rock.

### 7. Water Supply Intakes:

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: No water supply intakes involved with, or near, project

### 8. Adverse Effects From Impoundments:

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: no impoundments created by project

### 9. Management of Water Flows:

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: The project is designed to withstand high flows better than the existing condition by restoring bank stability. The project will not restrict flow because it is in within the existing channel and would maintain channel dimensions.

### 10. Fills Within 100-Year Floodplains:

Project would be within 100-year floodplains? ☒ Yes ☐ No

If yes, project would be in compliance with GC? ☒ Yes ☐ No

Explain: Project will maintain existing floodplain function.



**11. Equipment:**

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: Mitigations to minimize soil disturbance are listed in the attached CEQA document. See Summary of mitigations on pp 14-19.

**12. Soil Erosion and Sediment Controls:**

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: Project work to be completed during low flow period. Revegetation and mulching commences as the work moves down the valley.

**13. Removal of Temporary Fills:**

Project would be in compliance with GC? ☐ Yes ☐ No

Explain: not applicable

**14. Proper Maintenance:**

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: Maintenance needs are not expected because the project would restore the functionality of a vegetated streambank.

**15. Wild and Scenic Rivers:**

Project would be within a National Wild and Scenic River System (including proposed system)?

☐ Yes ☒ No

Project would be in compliance with GC? ☐ Yes ☐ No

Explain:

**16. Tribal Rights:**

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: Project would not affect any tribal rights.

**17. Endangered Species:** see Box 10 above.

**18. Historic Properties:** see Box 11 above.

**19. Designated Critical Waters (*check those that apply*)**

Includes:

- 1) ☐ NOAA-designated marine sanctuaries,
- 2) ☐ National Estuarine Research Reserves,
- 3) ☐ State natural heritage sites,
- 4) ☐ Officially designated waters

Applicant is aware of the restrictions a) and b) below? ☒ Yes ☐ No

a) NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50: No NWP can be authorized.

b) NWP 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38: Notification is required.

**20. Mitigation:** see Box 13 above.

**21. Water Quality** (401 Certification): see Box 14 above.

**22. Coastal Zone Permit:** see Box 15 above.

**23. Regional and Case-By-Case Conditions:**

Complete the Regional Conditions checklist below.

Project would be in compliance with any Case-by-case conditions? ☐ Yes ☐ No

Explain: n/a

**24. Use of Multiple Nationwide Permits:**

Applicant is aware that if total proposed acreage of impact exceeds acreage limit of NWP with highest specified acreage, no NWP can be issued? ☒ Yes ☐ No

**25. Transfer of Nationwide Permit Verifications:**

Applicant is aware of this permit transfer requirement? ☒ Yes ☐ No

**26. Compliance Certification:**

Applicant is aware of this post-construction requirement? ☒ Yes ☐ No

**27. Pre-Construction Notification:**

If a PCN is required, the PCN includes: *(check those that apply)*

☒ Delineation of wetlands and other waters of the U.S.

☐ If project results in the loss of greater than 1/10 acre of wetlands, a compensatory mitigation plan or statement describing how the mitigation requirement will be satisfied

☒ For non-Federal applicants, a list of threatened or endangered species or designated critical habitat that might be affected by the proposed work

☐ For Federal applicants, documentation demonstrating compliance with the Endangered Species Act

☒ For non-Federal applicants, a list of historic properties listed on, or determined eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places that may be affected by the proposed work; or a vicinity map indicating the location of the historic property

☐ For Federal applicants, documentation demonstrating compliance with the National Historic Preservation Act

**28. Single and Complete Project:**

Project would be in compliance with GC? ☒ Yes ☐ No

Explain: This is one single project, to be completed under this permit.

## **NWP Regional Conditions (RC) checklist:**

## **II. Sacramento District (SPK) in California, Nevada, and Utah:**

### **SPK Regional conditions to be applied across the entire Sacramento District including California, Nevada, and Utah (except Colorado):**

1. Is pre-construction notification (PCN) required? ☒ Yes ☐ No

If yes, notification pursuant to General Condition 27 is required using either the South Pacific Division Preconstruction Notification (PCN) Checklist or a completed application form (ENG Form 4345). In addition, the PCN shall include:

- a. A written statement explaining how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States;

- b. Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and size (in acreage) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the high tide line should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation; and
- c. Pre-project color photographs of the project site taken from designated locations documented on the plan drawing.

2. Will mitigation be completed before or concurrent with construction of the project? ☐ Yes ☒ No

Compensatory mitigation shall be completed as required by special conditions of the NWP verification before or concurrent with construction of the authorized activity, except when specifically determined to be impracticable by the Sacramento District. When project mitigation involves use of a mitigation bank or in-lieu fee program, payment shall be made before commencing construction.

3. Does the project have property which will be preserved as part of mitigation for authorized impacts? ☐ Yes ☒ No

If yes, the NWP verification shall be recorded against the preserved property with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records of title to or interest in real property.

Will structures, including boat ramps or docks, marinas, piers, and permanently moored vessels, be constructed in or adjacent to navigable waters? ☐ Yes ☒ No

If yes, the NWP verification shall be recorded against the area with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records of title to or interest in real property. The recordation shall also include a map showing the surveyed location of the authorized structure and any associated areas preserved to minimize or compensate for project impacts.

4. Will any wetlands, other aquatic areas, and/or any vegetative buffers be preserved as part of mitigation for impacts? ☐ Yes ☒ No

If yes, these areas shall be placed into a separate "preserve" parcel prior to discharging dredged or fill material into waters of the United States, except where specifically determined to be impracticable by the Sacramento District. Permanent legal protection shall be established for all preserve parcels, following Sacramento District approval of the legal instrument.

5. The permittee shall allow Corps representatives to inspect the authorized activity and any mitigation areas at any time deemed necessary to determine compliance with the terms and conditions of the NWP verification. The permittee will be notified in advance of an inspection.
6. Is a waiver of the 300 linear foot limitation for intermittent and ephemeral streams requested? ☐ Yes ☒ No

If yes, an analysis of the impacts to the stream environment, measures taken to avoid and minimize losses, other project alternatives that were considered (but were found not to be practicable), and a mitigation plan describing how the unavoidable losses will be offset, must be included.

7. Is a road crossing proposed? ☐ Yes ☒ No

If yes, road crossings shall be designed to ensure fish passage, especially for anadromous fish. Bridge designs that span the stream or river, utilize pier or pile supported structures, or involve large bottomless culverts with a natural streambed, where the substrate and streamflow conditions approximate existing channel conditions shall be employed.

Is an approach fill proposed? ☐ Yes ☒ No

Approach fills in waters of the United States below the ordinary high water mark are not authorized under the NWPs, except where avoidance has specifically been determined to be impracticable by the Sacramento District.

8. Are trenching activities proposed under NWP 12? ☐ Yes ☒ No

If yes, clay blocks, bentonite, or other suitable material shall be used to seal the trench to prevent the utility line from draining waters of the United States, including wetlands.

9. Are activities involving hard-armoring of the bank toe or slope proposed under NWP 13? ☐ Yes ☒ No

If yes, notification pursuant to General Condition 27 is required. Bank stabilization shall include the use of vegetation or other biotechnical design to the maximum extent practicable.

10. Is the activity proposed under NWP 23? ☐ Yes ☒ No

If yes, notification pursuant to General Condition 27 is required. The PCN shall include a copy of the signed Categorical Exclusion document and final agency determinations regarding compliance with Section 7 of the Endangered Species Act, Essential Fish Habitat under the Magnusen-Stevens Act, and Section 106 of the National Historic Preservation Act.

11. Are activities which will result in the loss of greater than 300 linear feet of streambed proposed under NWP 44? ☐ Yes ☒ No

If yes, the discharge shall not cause the loss of more than 300 linear feet of streambed unless the 300 linear foot limit is waived in writing by the Sacramento District for intermittent and ephemeral streams only. Loss of more than 300 linear feet of perennial streambed is not authorized.

Is the activity proposed within a water of the United States supporting anadromous fisheries? ☐ Yes ☒ No

This NWP does not authorize discharges in waters of the United States supporting anadromous fisheries.

12. Is channelization or relocation of an intermittent or perennial drainage proposed under NWPs 29 and/or 39? ☐ Yes ☒ No

If yes, channelization or relocation of intermittent or perennial drainage is not authorized, except when, as determined by the Sacramento District, the relocation would result in a net increase in functions of the aquatic ecosystem within the watershed.

13. Are temporary fills for construction access in waters of the United States supporting fisheries proposed under NWP 33? ☐ Yes ☒ No

If yes, temporary fills for construction access in waters of the United States supporting fisheries shall be accomplished with clean, washed spawning quality gravels where practicable as determined by the Sacramento District, in consultation with appropriate federal and state wildlife agencies.

14. Are activities which will result in the loss of greater than 0.5 acre of waters of the United States or the loss of more than 300 linear feet of ditch proposed under NWP 46? ☐ Yes ☒ No

If yes, the loss of greater than 0.5 acre of waters of the United States is not authorized. The discharge shall not cause the loss of more than 300 linear feet of ditch, unless the 300 foot linear foot limit is waived in writing by the Sacramento District.

15. Are any waters of the United States, including created, restored, or enhanced waters of the United States proposed for preservation under NWPs 29, 39, 40, 42, and/or 43? ☐ Yes ☒ No

If yes, upland vegetated buffers shall be established and maintained in perpetuity, to the maximum extent practicable, adjacent to all preserved open waters, streams and wetlands including created, restored, enhanced or preserved waters of the U.S., consistent with General Condition 20. Except in unusual circumstances, vegetated buffers shall be at least 50 feet in width.

16. Is the proposed project located with a histosol, fen, or wetland contiguous with a fen? ☐ Yes ☒ No

If yes, all NWP's except 3, 6, 20, 27, 32, 38, and 47, are revoked. Fens are defined as slope wetlands with a histic epipedon that are hydrologically supported by groundwater. Fens are normally saturated throughout the growing season, although they may not be during drought conditions. For NWP's 3, 6, 20, 27, 32, and 38, notification pursuant to General Condition 27 is required.

17. Are activities proposed within 100 feet of the point of groundwater discharge of a natural spring? ☐ Yes ☒ No

If yes, notification pursuant to General Condition 27 is required. A spring source is defined as any location where ground water emanates from a point in the ground. For purposes of this condition, springs do not include seeps or other discharges which lack a defined channel.

### **SPK Regional conditions to be applied only in California:**

1. Is the project located within Lake Tahoe Basin? ☐ Yes ☒ No

All NWP's within the Lake Tahoe Basin are revoked. Activities in this area shall be authorized under Regional General Permit 16 or through an individual permit.

2. Is the project located within the Primary and Secondary Zones of the Legal Delta? ☐ Yes ☒ No

NWP's 29 and 39 within the Primary and Secondary Zones of the Legal Delta are revoked. New development activities in this area will be reviewed through the Corps' standard permit process.

### **SPK Regional conditions to be applied only in Nevada:**

1. Is the project located within Lake Tahoe Basin? ☐ Yes ☐ No

All NWP's within the Lake Tahoe Basin are revoked. Activities in this area shall be authorized under Regional General Permit 16 or through an individual permit.

### **SPK Regional conditions to be applied only in Utah:**

1. Is the project located below 4217 feet mean sea level (msl) adjacent to the Great Salt Lake or below 4500 feet msl adjacent to Utah Lake? ☐ Yes ☐ No

For all NWP's in this area, except NWP 47, notification pursuant to General Condition 27 is required.

2. Will the project include bank stabilization activities that will affect more than 100 linear feet of perennial stream? ☐ Yes ☐ No

If yes, notification pursuant to General Condition 27 is required.

3. Will the project require NWP 27 authorization? ☐ Yes ☐ No

If yes, facilities for controlling stormwater runoff, construction of water parks such as kayak courses, and use of grout or concrete to construct in-stream structures are not authorized.

Will the project exceed 1500 linear feet (as measured on the stream thalweg), use in stream structures exceeding 50 cubic yards per structure, and/or incorporate grade control structures exceeding 1 foot vertical drop?

☐ Yes ☐ No

If yes, notification pursuant to General Condition 27 is required.

Will the project involve stream restoration? ☐ Yes ☐ No

If yes, the post project stream sinuosity shall be appropriate to the geomorphology of the surrounding area and shall be equal to, or greater than, pre-project sinuosity. Sinuosity is defined as the ratio of stream length to project reach length. Structures shall allow the passage of aquatic organisms, recreational water craft or other navigational activities unless specifically waived in writing by the District Engineer.



DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO CA 95814-2922

REPLY TO  
ATTENTION OF

July 26, 2012

Regulatory Division (SPK-2010-01482)

Leslie Mink  
Feather River Coordinated Resource Management  
Plumas Corporation  
P.O. Box 3880  
Quincy, California 95971-3880

Dear Ms. Mink:

We are responding to your July 06, 2012, request for a Department of the Army permit for the Integrated Greenhorn Restoration project. This approximately 2.2-acre project involves activities, including discharges of dredged or fill material, in waters of the United States to construct bank stabilization and restoration along 4,416 feet of bank using boulder vanes, vegetation, and bank sloping at three locations along the creek. Additionally the project proposes restoring fish passage at two dam locations. The restoration of fish passage at Shea Dam and Reid Dam will affect 800 feet of channel by raising the streambed with a riffle-pool structure using 8,000 cubic yards of 4'- pit run material from a nearby bridge replacement project. The project is located on or near Greenhorn Creek, Section 7, Township 24 North, Range 10 East, Mount Diablo Base and Meridian, Latitude 39.9472°, Longitude -120.8817°, Quincy, Plumas County, California.

Based on the information you provided, the proposed activity, resulting in the permanent impacts to approximately 1.887 acres and temporary impacts to .278 acres of perennial stream, is authorized by Nationwide Permit Number 27 Aquatic Habitat Restoration, Establishment, and Enhancement Activities. Your work must comply with the general terms and conditions listed on the enclosed Nationwide Permit information sheets and regional conditions, and the following special conditions:

Special Conditions

1. You and your authorized contractor shall allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that work is being or has been accomplished in accordance with the terms and conditions of this verification.
2. You shall notify this office of the start and completion dates for each phase of the authorized work within 5 calendar days prior to initiation of construction activities within waters of the U.S. and 30 calendar days following completion of construction activities.
3. Within 5 days prior to initiation of construction activities within waters of the United States, you shall submit to the Corps pre-construction site and aerial photographs of the project site,



which have been taken no more than 60 days prior to initiation of construction activities. Within 30 days following construction activities, you shall submit post-construction site and aerial photographs of the project site, showing the work conducted, to this office. The camera positions and view angles of post-construction photographs shall be identified on a map, aerial photo, or project drawing. Construction locations shall include all major project features and waters of the United States, including mitigation areas.

You must sign the enclosed Compliance Certification and return it to this office within 30 days after completion of the authorized work.

This verification is valid for two years from the date of this letter or until the Nationwide Permit is modified, reissued, or revoked, whichever comes first. Failure to comply with the General and Regional Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We would appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2010-01482 in any correspondence concerning this project. If you have any questions, please contact Matthew Kelley at Redding Regulatory Office, 152 Hartnell Avenue, Redding, California 96002, email [Matthew.P.Kelley@usace.army.mil](mailto:Matthew.P.Kelley@usace.army.mil), or telephone 530-223-9534. For more information regarding our program, please visit our website at [www.spk.usace.army.mil/Missions/Regulatory.aspx](http://www.spk.usace.army.mil/Missions/Regulatory.aspx).

Sincerely,



Matthew Kelley  
Chief, Redding Regulatory Office

Enclosure(s)

Copy Furnished without enclosure(s)

Mr. Dave Smith, US Environmental Protection Agency, 75 Hawthorne Street, San Francisco, California 94105

Mr. Scott Zaitz, Regional Water Quality Control Board, 415 Knollcrest Drive, Suite 100, Redding, California 96002

# BOARD OF SUPERVISORS

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TERRY SWOFFORD, DISTRICT 1  
ROBERT A. MEACHER, DISTRICT 2  
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LORI SIMPSON, DISTRICT 4  
JON KENNEDY, DISTRICT 5



October 02, 2012

Sierra Nevada Conservancy  
11521 Blocker Drive  
Auburn, CA 95603

Dear Grant Application Reviewers:

The purpose of this letter is to support Plumas Corporation's grant proposal to the Sierra Nevada Conservancy for approximately \$347,000 for implementation of bank stabilization and fish passage on Greenhorn Creek. Greenhorn Creek provides important irrigation water for agricultural producers, swimming opportunities, and is a popular trout fishery. Bank erosion along the channel has been a concern for some time.

The Plumas County Board of Supervisors contributed \$23,000 of Title III Secure Rural Schools planning money for the project in 2007 to address landowner concerns regarding bank erosion on Greenhorn Creek. Some of the project work has already been implemented, and this funding would be used to complete additional work. We understand that the project needs additional engineering review before our county Building Department will issue a grading permit for the remainder of the work. On-going coordination with the California Department of Fish and Game is also needed to determine the extent of treatments above Quincy Junction Road that protect the bank swallow and also address the on-going erosion. This funding would also allow these final planning details to be completed, as well as project construction.

Thank you for your consideration. With your help, we look forward to addressing these longstanding issues along this important stream in our community.

Sincerely,

Robert A. Meacher, Chair  
Plumas County Board of Supervisors

## Memo

**From:** Feather River Coordinated Resource Management Group Executive Committee

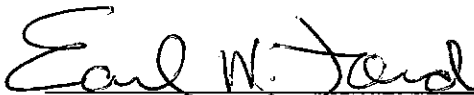
**To:** Sierra Nevada Conservancy

**Re:** Support for the Greenhorn Creek Integrated Restoration Project

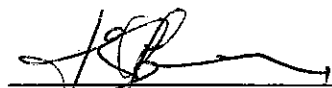
**Date:** August 29, 2012

October 3, 2012 EWF

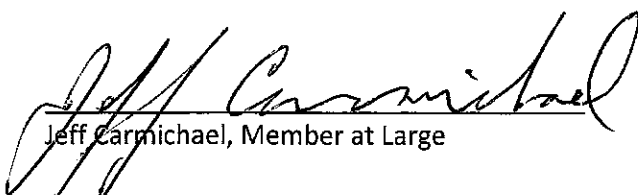
Thank you for considering the Greenhorn Creek Integrated Restoration Project for funding. The project would improve ranchlands in American Valley near Quincy while also improving habitat for trout. This project is a win-win situation for public natural resources and private landowners. The project enjoys broad support within our community, and has been in the planning phase since 2007, after landowner requests for assistance with bank and streambed erosion. We are looking forward to implementation, which would only be possible with your support. We urge you to fund the project and look forward to working with you to improve conditions in this important valley in our area.

  
Earl Ford, Plumas National Forest Supervisor

  
Lori Simpson, Plumas County Supervisor

  
John Olofson, Sierra Valley Resource Conservation District

  
Phil Noia, Feather River Resource Conservation District

  
Jeff Carmichael, Member at Large

## **LONG TERM MANAGEMENT PLAN**

### **Greenhorn Creek Integrated Restoration Project**

Long term management for the project is detailed in the Landowner Project Agreement document, signed by all participating landowners. The signed agreement is included in this grant application package as the land tenure document. Excerpts from the agreement follow:

#### **Project Monitoring**

Project monitoring has three objectives: 1) to document the success/failure of the project in meeting project goals; 2) to identify potential or actual need for post-project maintenance intervention; 3) to provide information to the landowner in developing long-term management decisions. Thorough project monitoring consists of both quantitative data collection and qualitative observation.

All direct data collection activities would be augmented by qualitative observations from casual visits, and landowner experience. All individuals conducting monitoring or other activities associated with the Greenhorn Creek Integrated Restoration Project will notify the landowners prior to visiting the property.

#### **Project Maintenance**

Quantitative and qualitative project stability monitoring will be focused on detecting the potential for additional lateral adjustment of the channel, or down-cutting, as well as anomalies in the channel bed deposition patterns. Typically, the project TAC will remain in place and active for many years after a project has been completed. This provides for long-term evaluation of monitoring data and observations, maintenance recommendations and support for landowner management decisions. Maintenance, ultimately, becomes the landowners' responsibility. However, Plumas Corporation can assist with seeking maintenance funds and guiding the necessary maintenance work.

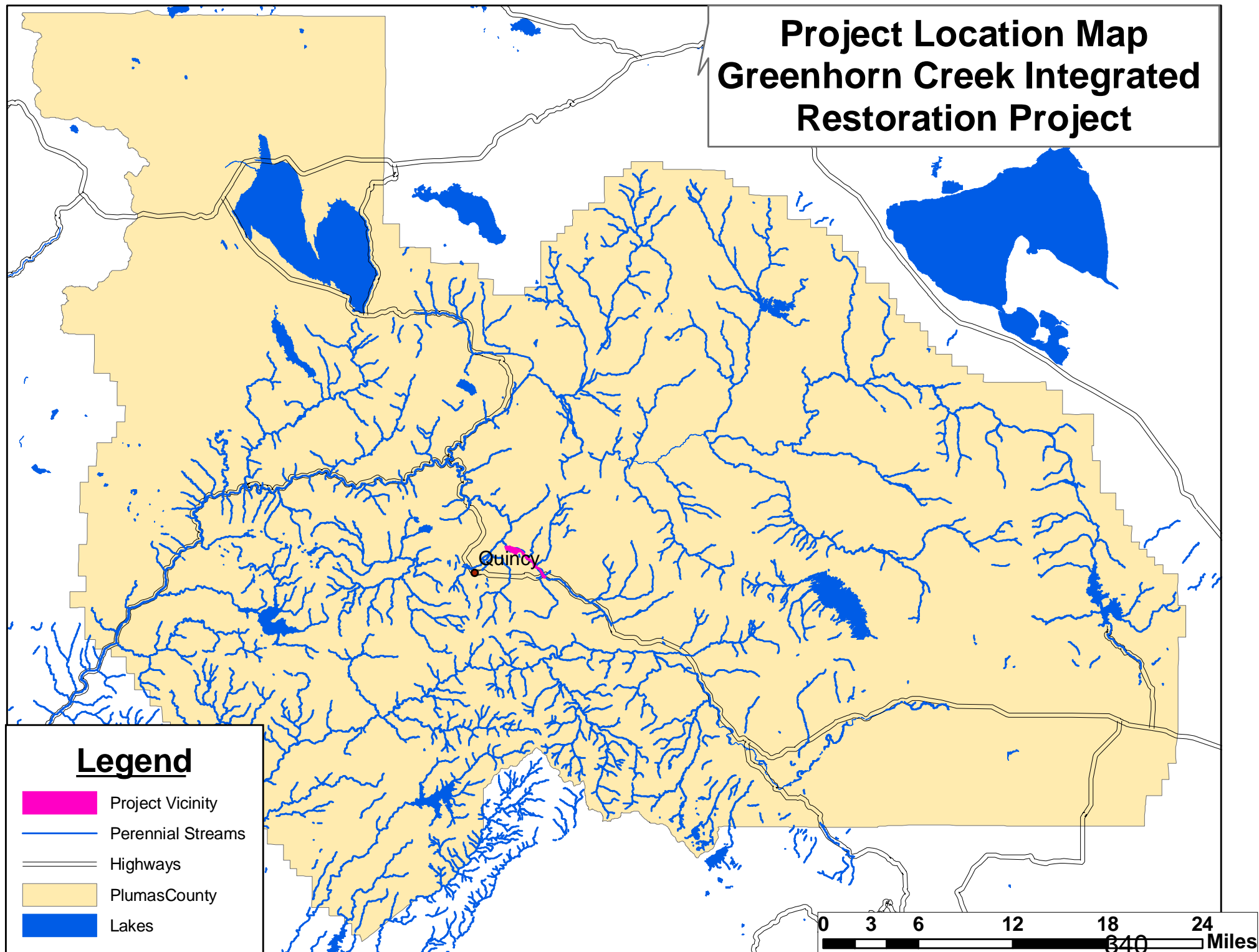
#### **Project Management**

The responsibility for managing the lands encompassing this project ultimately falls on each landowner, with support from Plumas Corporation and the project TAC.

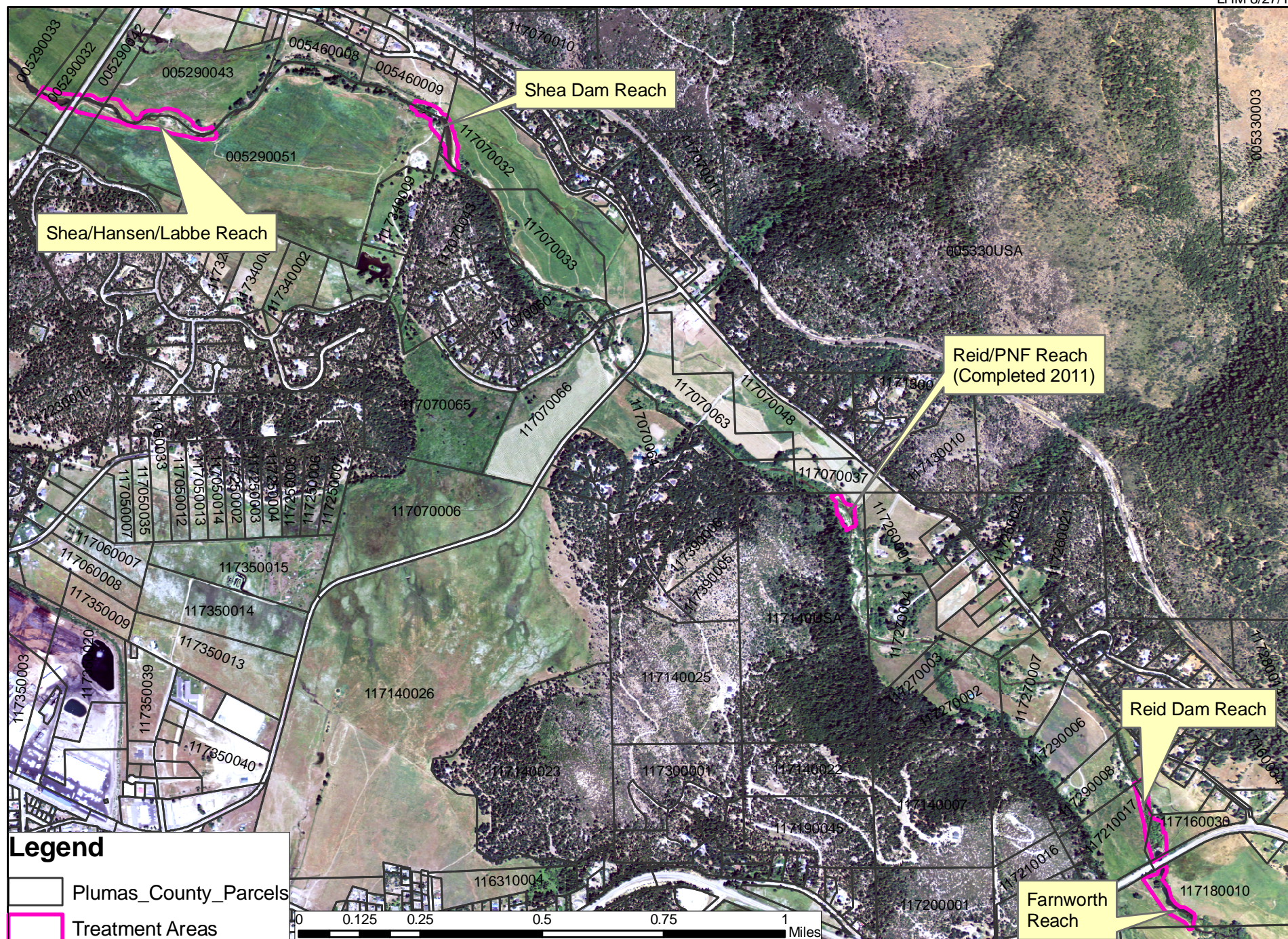
All disturbed areas within the entrenched channel should be excluded from grazing until monitoring indicates that the vegetation has recovered to the extent that it will be resistant to significant flood flow stress. This exclusionary period is expected to last two to three years after construction. Plumas Corporation will re-seed the disturbed areas with native seed and/ or cuttings to facilitate re-vegetation to the greatest extent possible. During the year of construction light grazing may occur within the areas of construction, early in the season.

All treatments areas are infested with noxious weeds, including star thistle, Canada thistle, and medusahead. Ground disturbance will exacerbate the weed problem. Disturbed areas will become monoculture weed stands without significant effort to get native species to occupy the sites. Landowners should try and control weeds populations in the treatment areas to the greatest extent possible prior to construction. Plumas Corporation will assist landowners with weed control and native species revegetation for two years after construction. Landowners have responsibility for long term vegetative composition and cover in the treatment areas.

# Project Location Map Greenhorn Creek Integrated Restoration Project







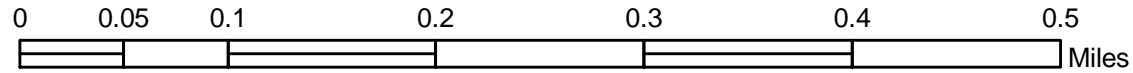


## Legend

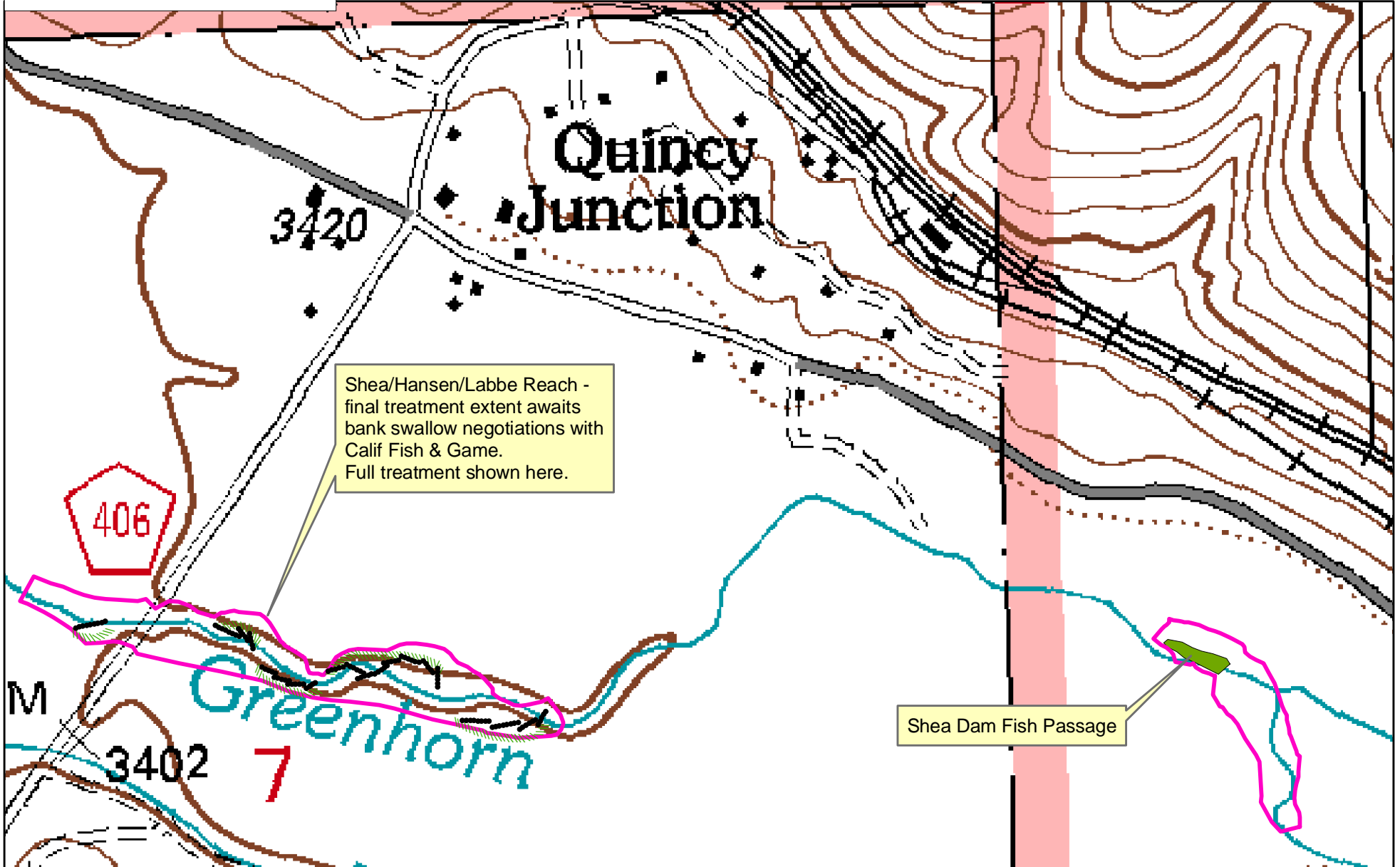
- Boulder Vanes
- Proposed Top of Terrace
- Treatment Reaches
- Fish Passage

## Greenhorn Creek Integrated Restoration Project Topographic Map 1 of 2

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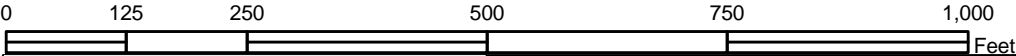
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# Greenhorn Creek Integrated Restoration Project

## Topographic Map 2 of 2

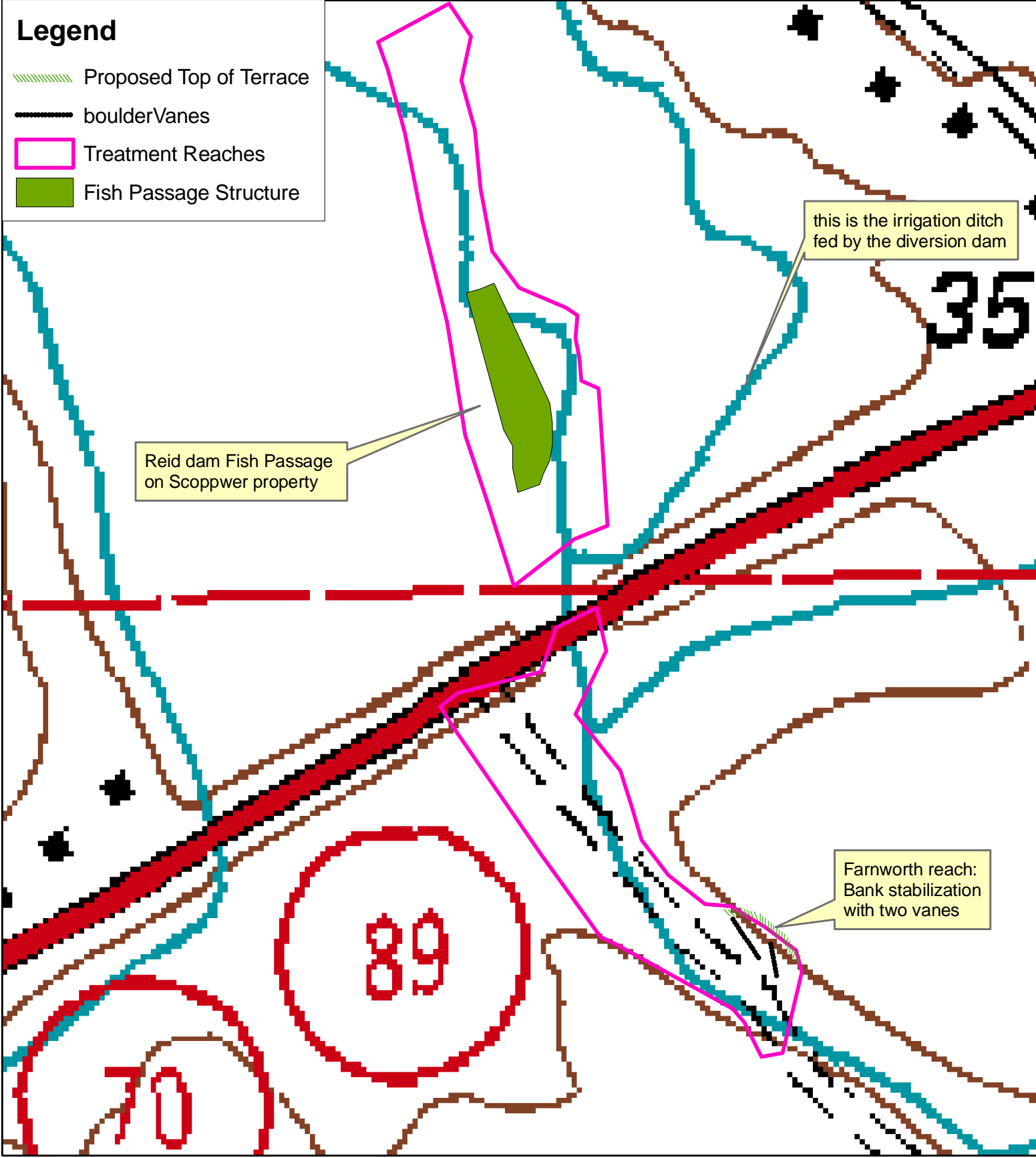
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LHM 8/27/12

### Legend

- Proposed Top of Terrace
- boulderVanes
- Treatment Reaches
- Fish Passage Structure







Above, Photo 1 of 4. Shea/Hansen/Labbe Reach. April 20, 2009.



Photo 2 of 4. Shea Dam Reach. April 2007.





Above, Photo 3 of 4. Reid diversion dam. April 3, 2009.



Photo 4 of 4. Farnworth Reach. February 23, 2009.

## **LANDOWNER PROJECT AGREEMENT FOR CONSTRUCTION AND SUSTAINABILITY**

### **Greenhorn Creek Integrated Restoration Project**

#### **Problem Statement:**

Excessive bank erosion along Greenhorn Creek is contributing to impaired aquatic and riparian habitats, degraded water quality, and loss of productive agricultural land. One of the primary sources of sediment in the Spanish Creek watershed is Greenhorn Creek. Storm monitoring has shown turbidity to increase by 144% from Greenhorn Creek's entry into American Valley, to its confluence with Spanish Creek. This turbidity introduces excessive sediment into aquatic environments that support trout, and comes from the erosion of productive agricultural land. Landowners have lost substantial property along the channel, and the channel has dropped in elevation, so that the floodplain is rarely accessed during flood events. Individual landowners have made several attempts to protect their properties from the erosion, but without an integrated approach, the problem continues to worsen. Two irrigation structures continue to hold a pre-degradational elevation of the streambed at two points, however, bed erosion below the structures threatens their integrity, and the dams are now impassable fish barriers. In their current state, these dams are at risk of failure. A catastrophic loss of these structures would add to Greenhorn Creek's ecological problems by causing severe head-cutting up the valley, and associated expansion of the gullied channel walls. The system is in an on-going degradational cycle with land loss associated with winter and spring high flows.

#### **Project Goals:**

The project area landowners (The Shea Ranch, the Reid Ranch, the Farnworth Ranch, Arthur Scoppwer, Allen and Erica Hansen, and the New England Ranch) share the common goals of reducing erosion of their lands along Greenhorn Creek and stabilizing the channel. Plumas Corporation, as a member of the Feather River Coordinated Resource Management Group (FR-CRM), seeks to further the FR-CRM mission of enhancing ecosystems and community stability. The Sierra Nevada Conservancy supports efforts that improve the environmental, economic, and social well-being of the Sierra Nevada region. These partners seek to join together to achieve their goals in the Greenhorn Creek Integrated Restoration Project. The partners seek to use Proposition 84 funding which was passed by California voters for the protection and restoration of rivers, lakes and streams, their watersheds, and associated land, water, and other natural resources.

#### **Implementation Plan:**

A four-year process of data collection, analysis and development of conceptual alternatives through the FR-CRM Technical Advisory Committee (TAC) process resulted in this project proposal to stabilize channel banks at two locations, and stabilize the channel bed below two agricultural irrigation dams. Bank stabilization would entail laying back and vegetating banks, and installing boulders vanes to maintain flow vectors in the center of the channel. Bed stabilization below the two agricultural irrigation dams entails construction of massive rock structure that steps the floodplain and channel elevations down on a 5% slope (versus the existing drop-off). The design thus protects the integrity of the dams while simultaneously restoring upstream fish migration. The project would be constructed using heavy equipment during low flows in 2013 and 2014. The landowners grant permission for Plumas Corporation and its contractors to perform the described project work on their properties.

#### **Project Requirements:**

The sustainability of all natural restoration projects requires certain key activities to provide for the long-term achievement of the partners' shared vision. This requires the identification of roles and

responsibilities in **monitoring, maintenance and management** of the project as well as potential funding resources beyond the construction period. It also requires, to the extent feasible at this time, identification of important thresholds for triggering maintenance and management decisions in the long-term.

### **Project Monitoring**

Project monitoring has three objectives: 1) to document the success/failure of the project in meeting project goals; 2) to identify potential or actual need for post-project maintenance intervention; 3) to provide information to the landowner in developing long-term management decisions. Thorough project monitoring consists of both quantitative data collection and qualitative observation.

#### **Monitoring Components – What would be monitored:**

- Water Quality- water temperature, turbidity
- Riparian Vegetation- vegetation type, density, cover
- Aquatic habitat- sedimentation, bank stability, depth, cover
- Trout fishery- Catch-Per-Unit-Effort

#### **Monitors by Component – Who would do the monitoring:**

- Water Quality- Plumas Corp, community volunteers
- Riparian Vegetation- Plumas Corp, landowners
- Aquatic habitat- Plumas Corp
- Trout fishery- Plumas Corp, landowners, community volunteers

#### **Monitoring Intervals – When would the monitoring occur:**

- Water Quality - water temperature: low flow season since 2001, and through 2015
- turbidity: storm and run-off events since 2002, and through 2015
- Riparian Vegetation- pre-project 2013, and through 2015
- Aquatic habitat- pre-project 2013, and through 2015
- Trout fishery - pre-project 2013, and through 2015

All direct data collection activities would be augmented by qualitative observations from casual visits, and landowner experience. All individuals conducting monitoring or other activities associated with the Greenhorn Creek Integrated Restoration Project will notify the landowners prior to visiting the property.

### **Project Maintenance**

Ideally, a natural restoration project should have minimal need for ongoing maintenance. However, as a 'disturbed' site, a restoration project will require several years to recover and develop the vegetative resistance necessary to absorb the impacts of infrequent, but high stress, events such as major floods or severe drought. Quantitative and qualitative project stability monitoring will be focused on detecting the potential for additional lateral adjustment of the channel, or down-cutting, as well as anomalies in the channel bed deposition patterns. Typically, the project TAC will remain in place and active for many years after a project has been completed. This provides for long-term evaluation of monitoring data and observations, maintenance recommendations and support for landowner management decisions. Maintenance, ultimately, becomes the landowners' responsibility. However, Plumas Corporation can assist with seeking maintenance funds and guiding the necessary maintenance work.

### **Project Management**

The responsibility for managing the lands encompassing this project ultimately falls on each landowner, with support from Plumas Corporation and the project TAC.

All disturbed areas within the entrenched channel should be excluded from grazing until monitoring indicates that the vegetation has recovered to the extent that it will be resistant to significant flood flow

stress. This exclusionary period is expected to last two to three years after construction. Plumas Corporation will re-seed the disturbed areas with native seed and/ or cuttings to facilitate re-vegetation to the greatest extent possible. During the year of construction light grazing may occur within the areas of construction, early in the season.

All treatments areas are infested with noxious weeds, including star thistle, Canada thistle, and medusahead. Ground disturbance will exacerbate the weed problem. Disturbed areas will become monoculture weed stands without significant effort to get native species to occupy the sites. Landowners should try and control weeds populations in the treatment areas to the greatest extent possible prior to construction. Plumas Corporation will assist landowners with weed control and native species revegetation for two years after construction. Landowners have responsibility for long term vegetative composition and cover in the treatment areas.

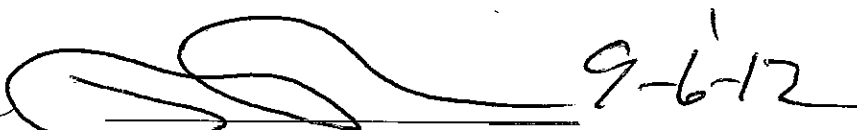
This agreement which outlines the roles, responsibilities and limitations of the partners will remain in effect for a period of ten years, through November 1, 2022. This agreement does not encumber the Sierra Nevada Conservancy, nor the State of California, nor Proposition 84 funds in any way.


### APPROVAL SIGNATURES


  
Bob Farnworth – Landowner      date

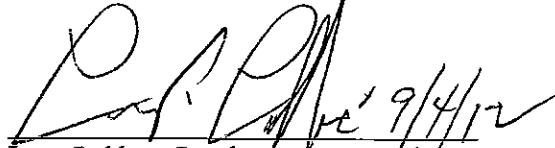
  
Arthur Scoppwer – Landowner      date

  
Johanne Daniels - Landowner      date

  
Russell Reid – Landowner      date

  
Victoria Shea – Landowner      date

  
Allen Hansen – Landowner      date

  
Lane Labbe – Landowner      date

  
Jim Wilcox – Plumas Corporation      date



